# MECCANO® Magazine

20p

QUARTERLY

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## SUCCESSFUL SEASON

With Autumn here I am pleased to report that, thanks to the work of modellers around the world, Meccano has enjoyed a marvellously successful summer display season. In addition to "official" shows mounted by the Company, many Clubs and individual enthusiasts have put on a record number of displays, ranging from individual models in local dealers' windows to large stands at giant national hobby fairs.

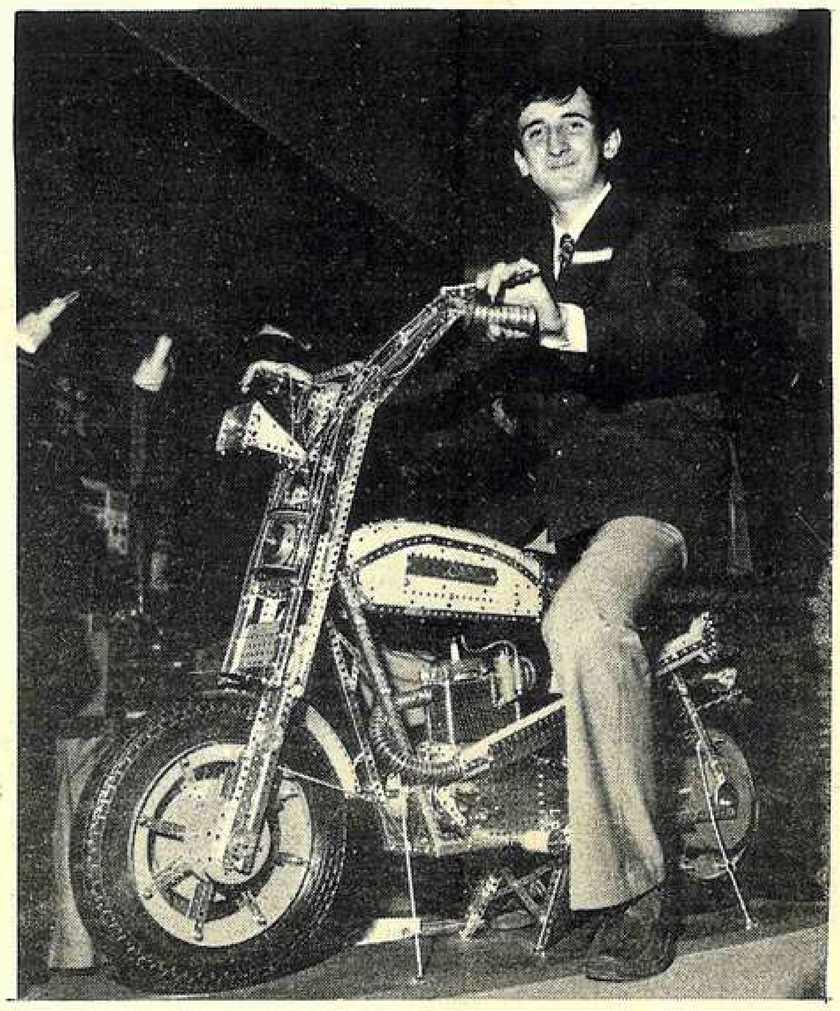
Large, or small, all these displays have been of inestimable value to the hobby and our thanks go to all the people concerned. For my own part, I would like to extend special appreciation to the Christchurch M.C. for their work at the New Zealand Industries Fair; the Transvaal Meccano Guild and Cape Town M.C. for their work at the Rand Hobbies Fair in South Africa; the Stevenage M.C. for several exhibitions during the year; the Midlands Meccano Guild for an outstanding display at the Stoneleigh Carnival and Geoff Wright, Mike Nicholls and Alf Reeve for organising the 2nd Annual Meccano Exhibition at Henley-on-Thames. Many other Clubs and individuals are equally deserving of mention, of course, but space is limited, therefore I trust that all those omitted will understand and forgive me.

### TITLE CHOSEN

In the first MMQ we mentioned that a meeting of enthusiasts had been held in Henley-on-Thames to consider forming a new Meccano Club for the area. I am now able to report that a Club has subsequently been officially formed under the title "The Henley Society of Meccano Engineers". Attached to it is a special junior branch ("The Henley Society of Junior Meccano Engineers") and I understand both this and the senior branch are already proving very successful. Our best wishes for continuing success go to both branches.

### ITALIAN VISITORS

A very good friend of Meccano Limited – and one of the world's leading modellers – is Mr. Giuseppe Servetti of Piacenza, Italy. In July, Mr. Servetti, his wife and son Gianguido, spent three weeks on holiday in Liverpool, Mr. Servetti himself spending most of the time



**Gianguido Servetti and Model (see "Italian Visitors").**

with us at Binns Road. The Servettis' brought with them from Italy a magnificent, almost-life-size freelance model of a motor cycle built, not by Giuseppe, but by 15 years-old Gianguido who has clearly inherited his father's modelling skill.

Amazingly detailed, the model features working head and tail lights, suspension, cable brakes, a sprung stand and a "kick-start" lever which activates an electrically driven soundbox mechanism reproducing the noise of the engine. The engine does not actually drive the bike, but a twist-grip throttle on the handlebars revs the 'noise" up and down realistically. So impressed were we with the model that, while the Servettis' were still here, we shipped it – and Gianguido – down to the Airfix/ Meccano Press Show in London's Festival Hall, where it caused quite a stir. Our picture, above, shows Gianguido demonstrating his machine at the Show.

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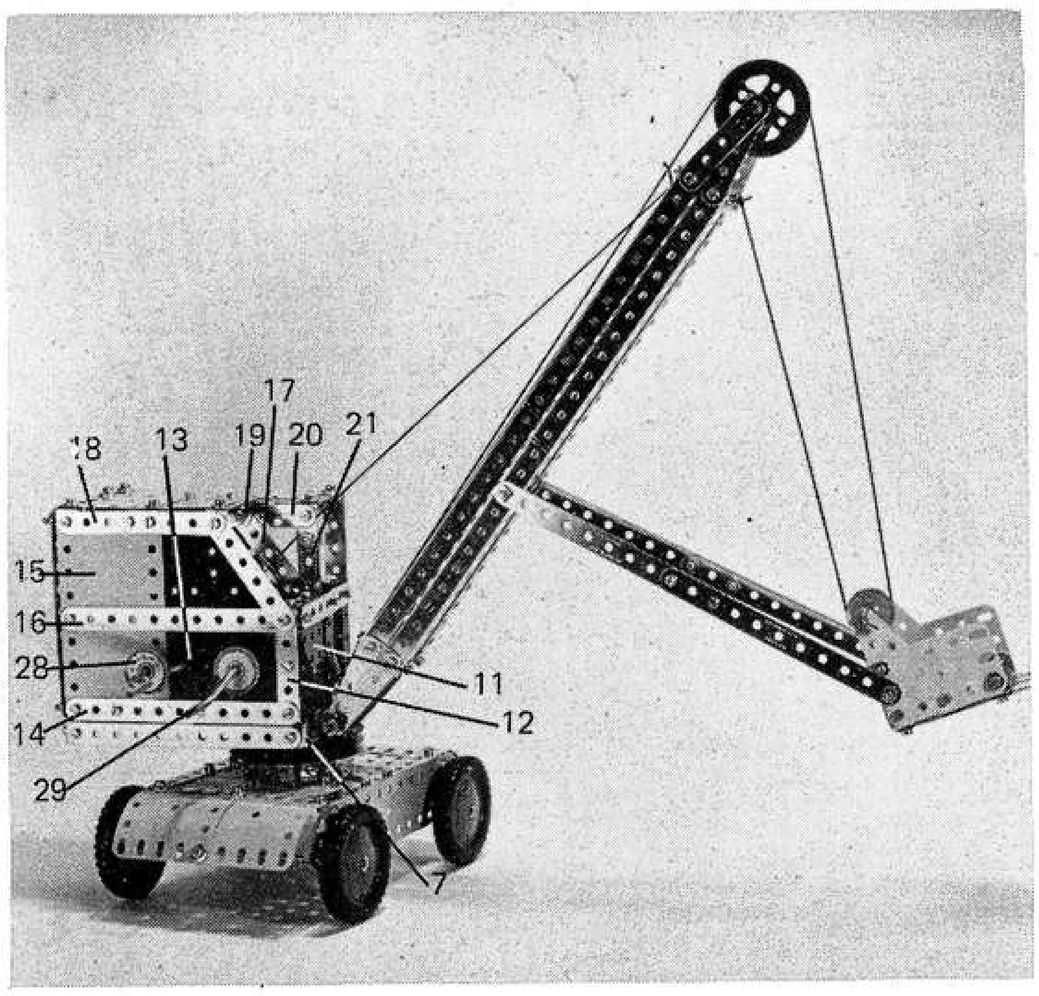
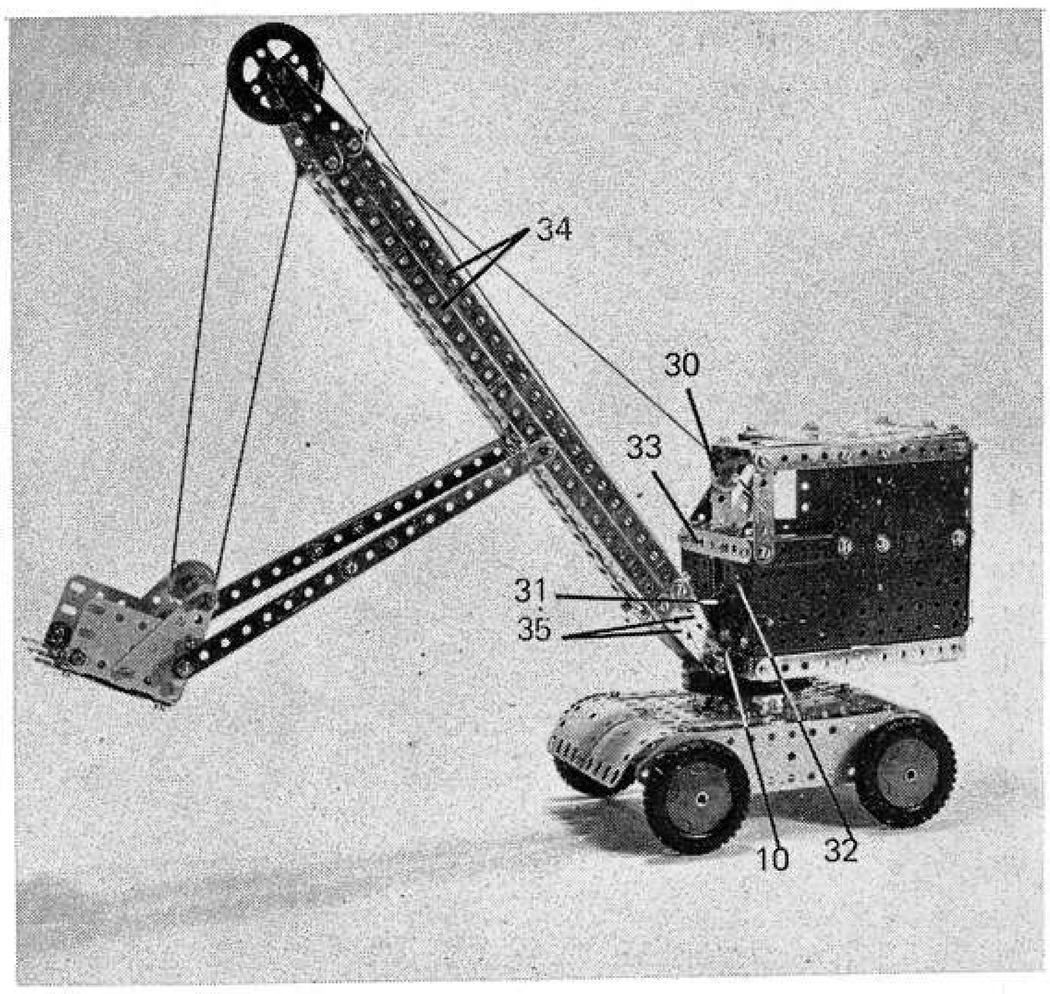
SET 7 MODEL .... SET 7 MODEL .... SET 7 MODEL




# MECHANICAL SHOVEL

## An Outfit Model

by "Spanner"

MECHANICAL SHOVELS, or excavators, have proved consistently popular with Meccano modellers for as long as Meccano has existed. Countless examples have appeared in Instructions Books and Meccano Magazines over the past 65 years, but, whenever a new version has appeared, it has always been well-received, no matter how many have gone before. Featured here, therefore, is another in a long line of mechanical shovels, this particular example being designed for owners of a No. 7 set. Well-proportioned, it makes an attractive model with fully-working features.

Construction begins with the mobile base. Two lateral 4½" x 2½" Flat Plates 1 are connected together at the edges by two 5½" Strips 2 and, three holes in, by two 2½" Strips 3. The end Bolts holding Strips 2 in position also fix Angle Brackets to the underside of the outer corners of plates 1, as well as helping to hold the end plating of the chassis in place. At one end, this plating is supplied by two 2½" x 2½" Flexible Plates, curved to shape, while, at the other end, the plating consists of a 2½" x 2½" Curved Plate and a 2½" U-Section Plate, the latter opened out to the correct shape. Bolted to the spare lugs of the Angle Brackets at each side is a 5½" Strip overlaid by a 5½" x 1½" Flexible Plate 4 extended at each end by a Flat Trunnion.

Journalled in the lower base holes of each pair of Flat Trunnions is a 5½" compound rod, built up from a 4" and a 1½" Rod, held in place by 2½" Road Wheels. A 3" Pulley 5 is attached to the top of the chassis by four Double Brackets, two bolted to Strips 3 and two bolted to Plates 1.

Turning now to the body, the floor section is built up from two 3½" x 2½" Flanged Plates 6 joined together, with a ½" distance separating them, by two 5½" Strips bolted to their flanges, the front securing Bolts also fixing a 3½" x ½" Double Angle Strip 7 between the Flanges of the forward Plates, and the rear securing Bolts also holding Angle Brackets in place. These Angle Brackets are connected by a 3½" Strip 8. A 3" Pulley 9 is attached to the underside of forward Plate 6 by two Double Brackets, while a 1½" x ½" Double Angle Strip 10 is bolted to the centre of Double Angle Strip 7.

A 2½" x 1½" Flanged Plate 11, the non-flanged sides enclosed by 2½" x ½" Double Angle Strips 12, is now bolted to the forward edge of front Plate 6 in the position shown. Bolted to the inside of each Double Angle Strip is a Flanged Sector Plate 13, the securing Bolt passing through the centre hole of the Double Angle Strip and through the centre hole in the narrow end of the Flanged Sector Plate. The rear end of the lower flange of each Sector Plate is bolted through the corresponding hole in rear Plate 6. The wedge-shaped space between the Sector Plate and the floor of the body is enclosed by another 5½" Strip 14, the securing Bolts also holding a 4½" x 2½" Flexible Plate 15 and a rear Angle Bracket in place. This Angle Bracket will later provide an anchoring point for the back of the body.

A further 5½" Strip 16 is bolted between the centre of Flexible Plate 15 and the top of Double Angle Strip 12, the securing Bolt in the latter case also holding a 3" Strip 17 in place. This Strip is angled rearwards, as shown, and its upper end is connected to a 4" compound strip 18 which is also bolted to the upper end of Flexible Plate 15. Note that the Bolt connecting Strips 17

and 18 also hold a 1½" x ½" Double Angle Strip 19 in place by its right-hand lug. Bolted to the left-hand lug of this Double Angle Strip are a horizontal 5½" Strip 20 and a downward-angled 3" Strip, the latter coinciding with Strip 17 to form the cab window frame. The forward end of Strip 20 is connected to the lower end of the 3" Strip and to the other end of left-hand Double Angle Strip 12 by a 2½" Strip 21.

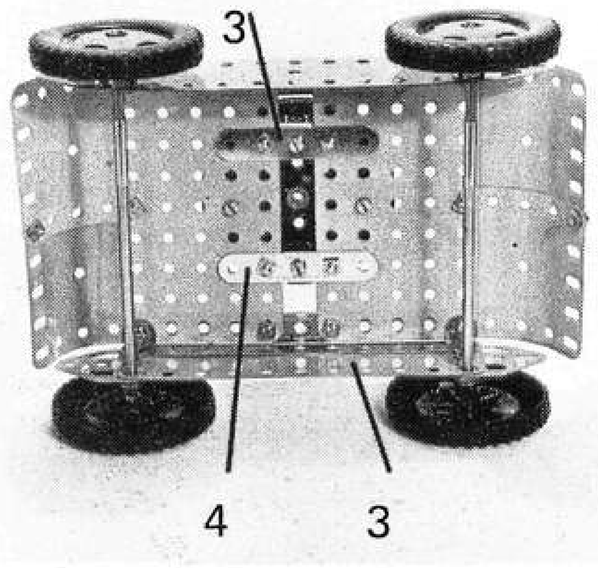
The left-hand side of the body is more easily enclosed by a 5½" x 2½" Flanged Plate 22 extended upwards by a 2½" x 2½" Plastic Plate 23, a 2½" x 1½" Plastic Plate 24 and 2½" x 2½" Transparent Plastic Plate, the latter overlaid along its forward edge by a 2½" Strip 25. The upper edges of the Plates are overlaid as shown by a 5½" Strip, the rear securing Bolt also helping to fix a 3½" x ½" Double Angle Strip between the sides and holding an Angle Bracket in position to provide an anchoring point for the back of the body. A corresponding Angle Bracket anchoring point is provided at the right-hand side of the body, then the back is enclosed by a 4½" x 3½" compound flexible plate 26 edged at top and bottom by 3½" Strips 27. The compound plate is built up from one 4½" x 2½" and two 2½" x 2½" Flexible Plates. Note that the back plate is attached to its anchoring points by 3/8" Bolts which are first fixed, shanks pointing outwards, by Nuts in the anchoring point. This enables the plate to be simply slipped onto the shanks of the Bolts and secured in place by further Nuts, thus avoiding the need to "struggle" with Nuts inside the body.

Before fitting the roof it is advisable to complete the two winding mechanisms for later control of the jib and bucket. The jib control is provided by a 5" Crank Handle, fitted with a 1" Pulley 28 and journalled in Flanged Sector Plates 13. After being passed through the Plates it is fitted with a ¾" Washer, (against the inside Plate) and a 1" Pulley, a space of approximately 1" separating the Pulley from the Washer. This section of the Crank Handle serves as the winding drum and is wound with a long length of Cord. A simple brake for the Crank Handle is provided by Bolts screwed into the boss of Pulley 28, striking against the protruding shank of a 3/8" Bolt held by a Nut in right-hand Flanged Sector Plate 13. The Crank Handle should be free to slide a short distance in its bearings to enable the Bolts to be disengaged.

Situated forward of the jib control is the bucket control. This is provided by a 3½" Crank Handle 29 also journalled in Flanged Sector Plates 13 and fitted with 1" Pulleys and a ¾" Washer exactly as before. A similiar braking system is provided, which of course means that the Crank Handle should be free to slide a short distance in its bearings. Cord is wound round the winding drum section of the Crank Handle.

A free-running guide pulley for the jib cord is supplied by a ½" Plastic Pulley without boss 30, which is carried on the shank of a ¾" Bolt held by Nuts in the second hole of Strip 21. A 1" Pulley without boss 31 serves as the guide pulley for the bucket Cord, this being held by a Spring Clip on a 3½" Rod journalled in left-hand Double Angle Strip 12 and in Flanged Plate 22. The lower front section of the body is then completed by a 2½" x 1½" Plastic Plate 32 which is bolted to the front flange of Plate 22 and to a 3½" Strip 33 bolted between the flange of Plate 22 and Flanged Plate 11. The lower right-hand corner of the Plastic Plate is bolted to a Fish-plate which is in turn bolted to Double Angle Strip 7.

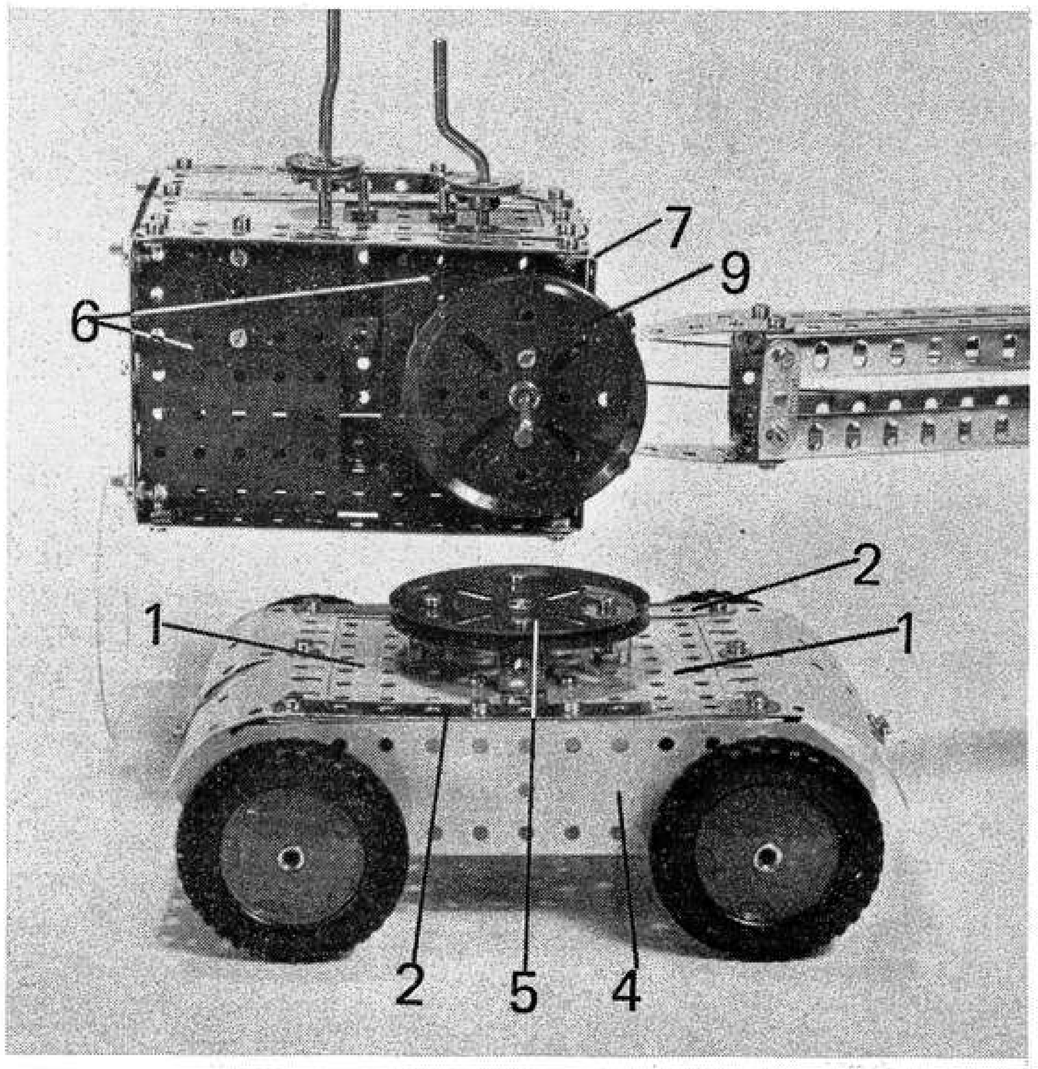
The roof can now be added, this being built up from a 5½" x 1½", a 2½" x 1½" and two 2½" x 2½" Flexible Plates, arranged as shown and bolted to the above-mentioned Double Angle Strip 19, to the top rear 3½" x ½" Double Angle Strip and to the sides of the body by Angle Brackets at appropriate points. The completed body is then mounted on the Chassis by means of a 2" Rod held in the boss of Pulley 9 and positioned free in the boss of Pulley 5.



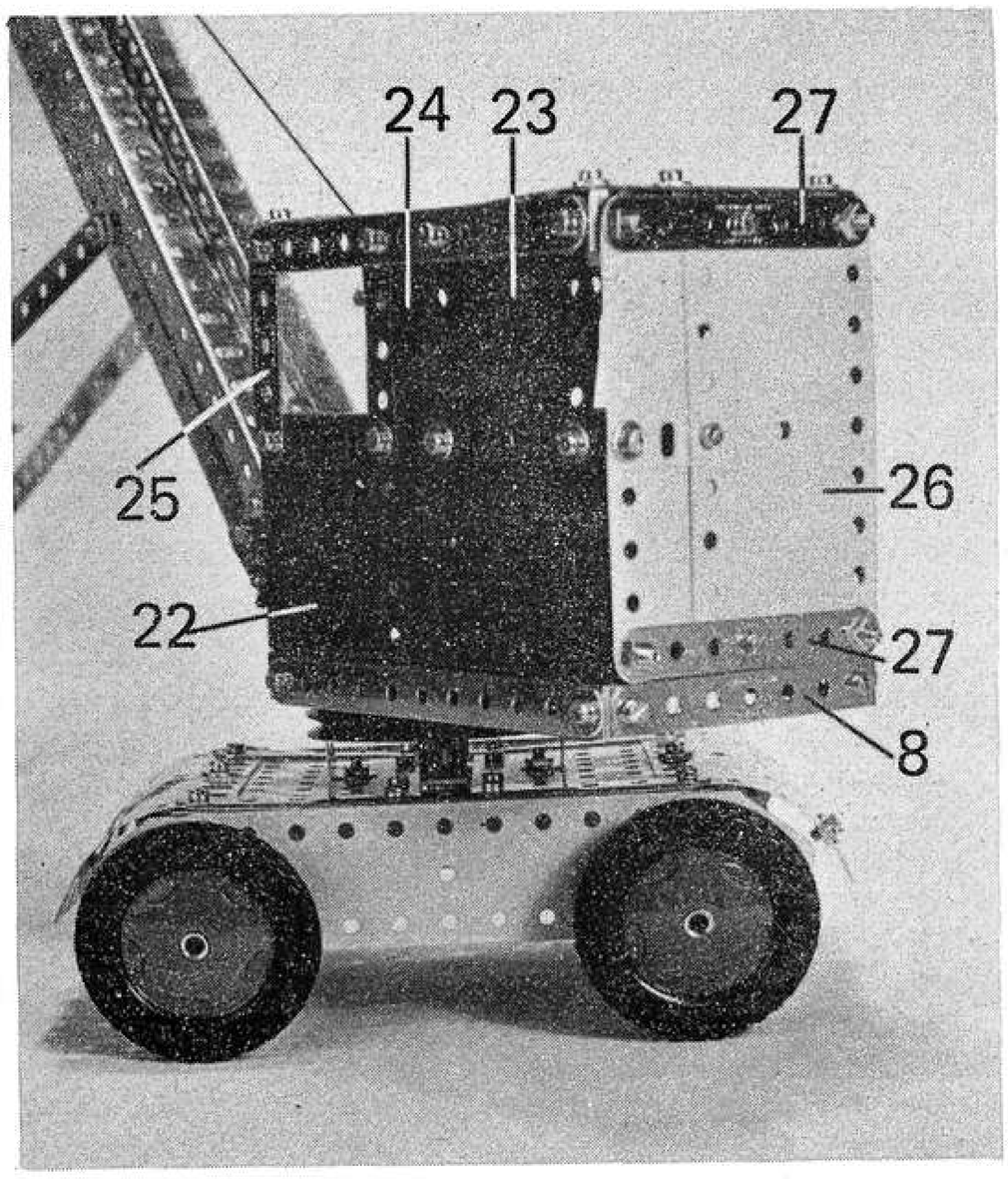

**An underside view of the chassis. Note that the main axles are built up from Rods joined by Rod Connectors.**

## JIB AND BUCKET

This brings us to the jib which is built up from two U-section girders, each consisting of two 12½" Angle Girders 34 joined flange-to-flange at each end by a Fishplate, the securing Bolts also holding two 2½" Strips 35 in position. These Strips are bent inwards slightly and their free ends overlapped to form a single end hole, then the two U-section girders are connected together at each end by 1½" Strips 36, top and bottom. The lower end of the jib is pivotally attached to the body by means of a 2" Rod inserted through the lugs of Double Angle Strip 10 and the end holes in lower Strips 35, being held in place by Collars. Held by Spring Clips in the end holes of upper →




**Opposite page, two general views of a well - proportioned and fully-operating Mechanical Shovel, or Excavator, built from the contents of a No.7 Meccano Set. Right, a close-up view of the body and chassis, separated from each other. Note the use of Flat and Flanged Plates to give strength and rigidity.**

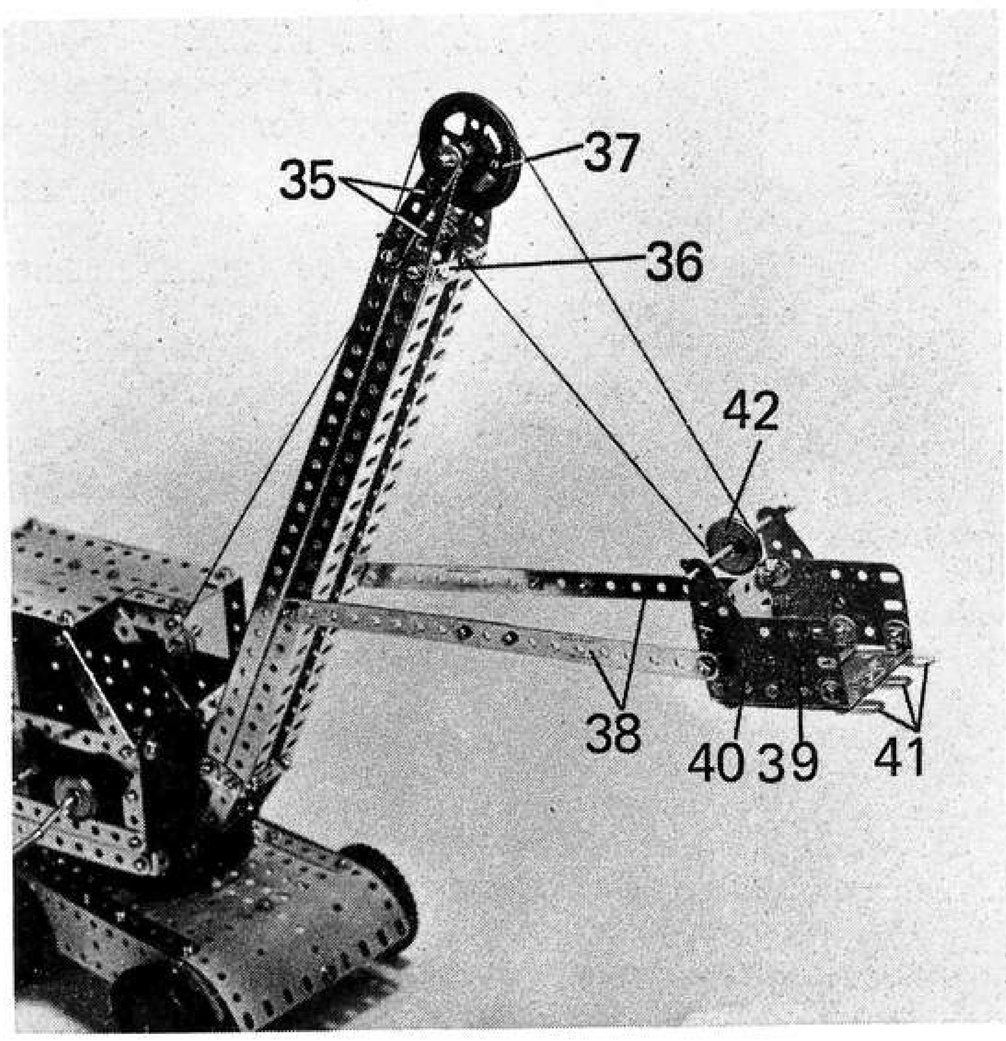



**A close-up view of the Mechanical Shovel showing the back and side of the body. The Bolts holding the back in place are first fixed by Nuts in the appropriate anchoring points, shanks pointing outwards, then the complete back compound plate is secured on the bolt shanks by further Nuts. This greatly simplifies what might otherwise be an awkward constructional problem.**

Strips 35 is a 1½" Rod carrying a 2" Pulley 37.

Lock-nutted to the jib through the tenth holes of lower Angle Girders 34 is the bucket arm which consists quite simply of two 9½" compound strips 38, each built up from two 5½" Strips overlapped three holes. The bucket, pivotally attached to the lower end of Strips 38, is built up from two 2½" x 1½" Flexible Plates 39, each overlaid by a 2½" x 1½" Triangular Flexible Plate 40, connected together by three 2½" x ½" Double Angle Strips. Bolted to the underside of these Double Angle Strips is a 2½" x 2½" Plastic Plate, forming the base of the bucket, the front securing Bolts also fixing three Fishplates 41 to the underside of the forward Double Angle Strip to provide "digging teeth". The back of the bucket is enclosed by another 2½" x 1½" Flexible Plate attached to the base and sides by Angle Brackets. A 3½" Rod, carrying a 1" Pulley 42, is held by Spring Clips in the apex holes of Triangular Flexible Plates 40. The completed bucket is then attached to the lower ends of compound strips 38 by two ½" Bolts, each passed through the rear row centre hole of one or other Flexible plate 39, fitted with a Collar and then passed through the end hole of Strip 38, after which it is held in place by two lock-nutted Bolts.

To finally complete the model, only the cording now remains to be finished. The jib control cord is simply taken under ½" Pulley 30 and tied to upper Strip 36 in the jib. The bucket control is taken under 1" Pulley 31, up and over 2" Pulley 37 at the head of the jib, down and around 1" Pulley 42 in the bucket and is brought back up to be finally tied to the other 1½" Strip in the upper section of the jib.




**This view of the model shows the jib head, bucket arm and bucket. Because of the parts remaining in the No.7 Set when the bucket arm and bucket were designed, neither of these sections is particularly complex, but they both do their jobs perfectly well.**

**PARTS REQUIRED**

| | | | |
|---|---|---|---|
| 14- 2 | 1-19h | 5- 48a | 1-176 |
| 4- 3 | 1-19s | 2- 48b | 4-187 |
| 2- 4 | 1-20a | 1- 51 | 4-188 |
| 14- 5 | 5-22 | 1- 52 | 3-189 |
| 4- 6a | 1-22a | 2- 53 | 6-190 |
| 4- 8 | 1-23 | 2- 53a | 2-191 |
| 7-10 | 5-35 | 2- 54 | 1-193a |
| 4-11 | 148-37a | 4- 59 | 2-194 |
| 12-12 | 129-37b | 1-111 | 2-194a |
| 2-15b | 30-38 | 3-111a | 1-199 |
| 2-16 | 2-38d | 6-111c | 1-200 |
| 2-17 | 2-40 | 2-125 | 2-213 |
| 3-18a | 2-48 | 4-126a | 2-221 |
| 2-19b | | | |

**CHANGES IN NEW ZEALAND**

With the retirement on 31st March this year of Mr. T. J. Kirkup, Managing Director of Models Limited of Auckland – Meccano's New Zealand Agent since 1933 – the Company was sold and its name changed to Models (NZ) Ltd., The revised Company, however, continues as Meccano's New Zealand Distributor.

After such a long association with Meccano, we are naturally sad to see Mr, Kirkup go, but we wish him a long and happy retirement. At the same time we welcome Mr. Don Mackenzie as the new Managing Director.

Mr. Mackenzie was previously connected with Meccano in Australia and will be known by many Modellers in that part of the world. Now in New Zealand, he is very anxious to assist any enthusiast interested in reviving Meccano Clubs in Auckland, Wellington and Dunedin. Mr. Mackenzie may be contacted at Models (NZ) Ltd., 53 Fort Street, P.O. Box 6986, Auckland. He would also like to hear from anyone who would like to have unusual Models exhibited.

# STONELEIGH SUMMER CARNIVAL

* * *

## MIDLAND M.G. MOUNTS BIG MECCANO DISPLAY

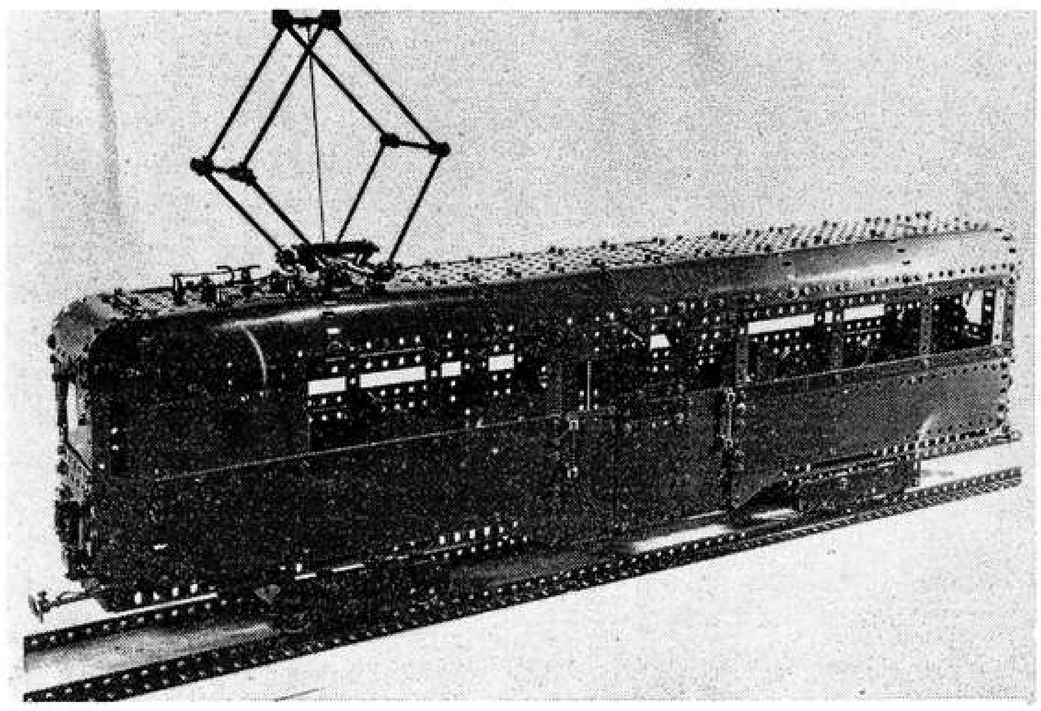
A TOKEN display of Meccano models at last year's Stoneleigh carnival so impressed the organisers that they offered the Midlands Meccano Guild a full length exhibition stand in the Special Features Section for this year's meeting at the Royal Agricultural Show Ground at Stoneleigh near Kenilworth in Warwickshire.

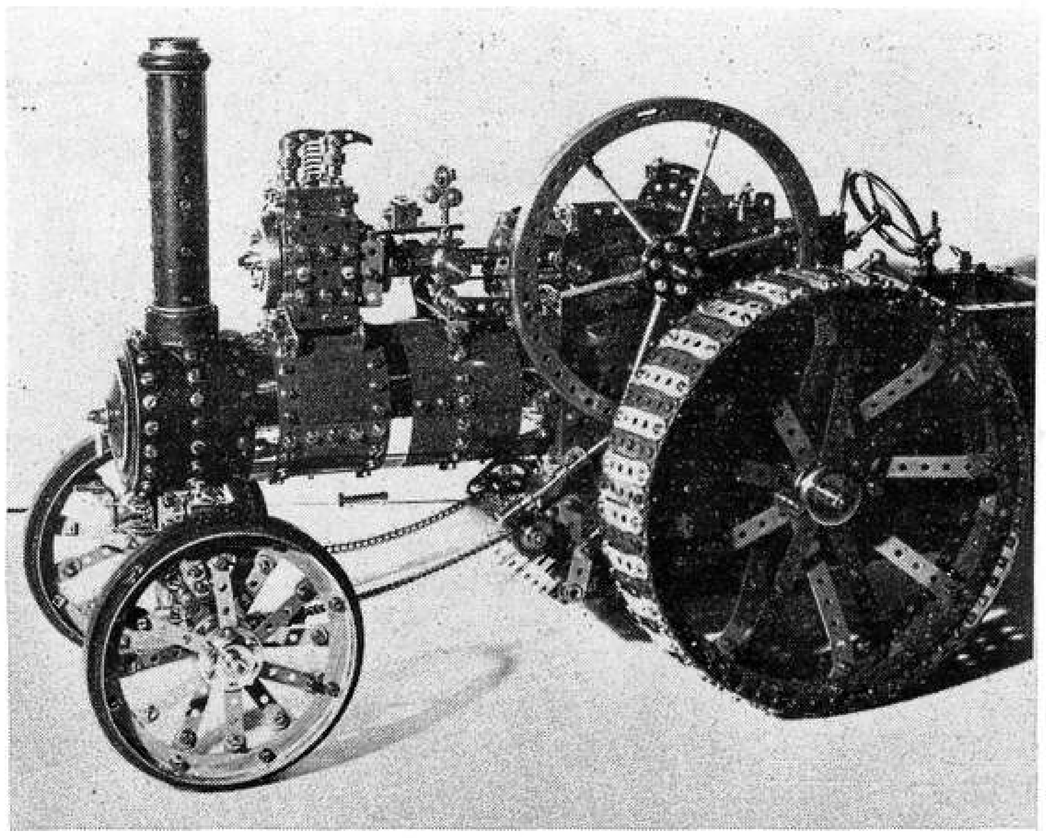
Rising to the challenge, several members of the Midlands Meccano Guild turned up with models from various parts of the Midlands and the South. Ernest Chandler, the Guild Chairman, did most of the spade work in liaising with the Stoneleigh Committee and was also chief transport supplier in getting some of Bert Love's giant models over from Birmingham. Esmond Roden, the Guild's President, actually camped on the grounds in his trailer caravan for the three days of the show over the Bank Holiday week-end. He brought his fine set of rail-mounted tramcars which were electrically driven, plus an electrified "Steam" railcar of the old G.W.R.

Steam featured quite prominently because Ernest Chandler had the new Meccano Steam Engine working practically all through the show, driving Double Fly-Boats, apart from his Showman's Road Locomotive, and engine-man's trailer.

Bert Halliday also had his giant showman's engine on display, polished up like the genuine article and almost unbelievably made from standard Meccano parts. Bert

**Above, superb detail modelling shows in this shot of Dennis Perkin's scale Agricultural Engine which reflected the general theme of the Stoneleigh show. Below, a single-deck Continental Tram Car by Esmond Roden – typical of his demonstration models at Stoneleigh.**





Love also demonstrated steam in his Super Model Steam Derrick, circa 1930, described elsewhere in this issue of the MMQ. He displayed his No. 10 Set Grandfather Clock which caused such a wide interest at the Henley Meccano Exhibition and this was flanked with yet another Meccano Grandfather Clock which was electrically driven to keep perfect time. These last models framed Bert's giant Block setter, running by remote control to the fascination of the public who thronged the exhibition hall despite the tremendous counter attractions and displays outdoors on the showground which enjoyed marvellous sunshine.

David Guillaume showed his Servetti Magician which worked splendidly to the delight of hundreds of youngsters who could not fathom how the model cars changed so miraculously under the Magician's hands. Clive Hine showed a sturdy side-lifting Fork Truck and Stephen Lacey demonstrated his live-steam Meccano Narrow Gauge Locomotive. Dennis Perkin's beautiful large-scale agricultural Traction Engine performed faultlessly and he also showed a compact Excavator, built from prototype drawings and running on Plastic Caterpillar Track which looked and worked exactly like the real thing with excellent detail and carefully designed authentic rigging of the ropework. Bert Shaw brought his massive North Sea Meccano Oil Rig all the way from Nottingham and, with sundry other models, the Midlands Meccano Guild filled up every available inch of alloted space and even had to put up extra tables for an overflow!

Bert Halliday, who did sterling service by manning the Stand with Esmond Roden for most of the time throughout the three days, also demonstrated his latest version of the Meccano Designing Machine – a great advance on the early Meccanograph and capable of producing multi-colour tracery which would have done credit to a bank note designer!

The organisers of the Stoneleigh Carnival were very pleased with the Guild's display which was very much a 'live' one (which is really what Meccano is all about!) and they were staggered by the attention which the models received from the public. Many an old hand who visited the Show – including Mr. Hubert Lansley, the very first "Spanner" of the 1920 decade, long retired from Binns Road – were obviously filled with nostalgia as they lingered over the exhibits recalling their past Meccano experiences. That's the beauty of Meccano – it's so versatile it's ageless and can span a lifetime of interest. All members of the Guild who supported the show travelled far and worked hard but they certainly put Meccano on the Warwickshire map!

# AMONG THE MODEL BUILDERS

## with "Spanner"

IT'S BEEN SAID many times by many people, but I make no apology for repeating it here: Meccano is a tremendously useful commodity!

To the Meccanoman, of course, it is a totally absorbing, self-contained hobby – an end in itself – but, to other people, it can be more a means to an end by providing a source of amazingly versatile "ready-made" components to assist in the construction of something other than a purely-Meccano model. Mr. J. van Raalten of De Bilt, Holland, for instance, is a Meccano Modeller who is also a keen amateur astronomer and he has successfully used his first hobby to help him with his second, as can be seen from the photographs below.

In astronomy, the constant rotation of the earth can cause a bit of a problem. If, for example, an astronomer is studying a particular star, then that star will appear to move across the heavens as the earth rotates. This of course means that every time the astronomer returns to his telescope after a break in observation, the telescope will be pointing in the wrong direction and he must search for his star – a job which may take considerable time if, indeed, he ever finds it again. Also, many astronomers take long-exposure and time-lapse photographs through their telescope, for which they need to be "locked-on" to their subject otherwise the movement of the earth will swing their 'scopes off-target.

Using Meccano, Mr. van Raalten has built a device to overcome the problem: a motorised driving system for the polar axis of his 8" astronomical telescope. This system turns the telescope at the same rate as, but in opposition to, the rotation of the earth so that it remains pointing at the same chosen spot in space. We do not have the (editorial) space to go into full constructional detail here, but the following few comments from Mr. van Raalten may be of interest. His device is driven by a 1 r.p.m. non-Meccano mains motor, by the way.

"As a sidereal day is 23 hrs. 56 mins. 4 sec. or 1436 mins. 4 sec" says Mr. van Raalten, "I required a reduction of about 1436:1. A large gear was necessary and so I used a ring of large-toothed Quadrants and the Pinion to give an initial reduction of 10·5:1, followed by a further reduction of 60:1, using a Worm and a 60-teeth Gear, and a final reduction of 2.28:1 from a 25-teeth Pinion and a 57-teeth Gear at non-standard Meccano meshing using a Plate with elongated holes.

"Multiplied together, 10.5 x 60 x 2.28 give a final reduction of 1436.4:1, allowing the polar axis one revolution in 1436 min. 24 sec. Thus there is a difference of only 20 seconds in 24 hours, or 5/6 sec. an hour. This represents a movement of only 12½ arc seconds in one hour and this difference is negligible; even if one wants to take photographs of the sky."

Mr. van Raalten reports that, initially, some serious trouble was caused by fluctuations in the frequency of the mains current feeding the drive motor. Being a synchronous motor, drops in the frequency cause the motor to slow down, but he has overcome the problem by, if I understand his notes correctly, using a battery-powered Meccano Motor-with-Gearbox, to override the mains motor by turning the mains motor, in its housing, at the required speed while the frequency-drops last. Increased frequency, resulting in the motor running too fast, is counteracted by simply stopping the motor for short periods.

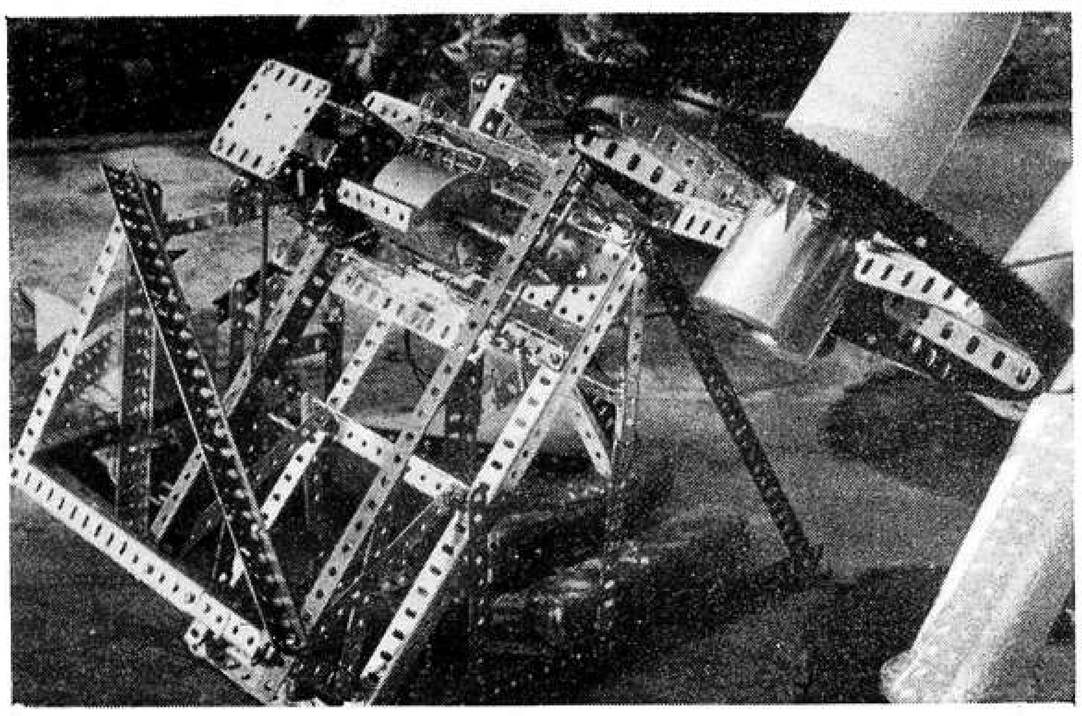
I leave the last word on his model to Mr. van Raalten, "From a Meccano point of view," he says, "The Model is not beautiful (it looks like an out-of-space vehicle!) but it is efficient and that was its purpose." That's what matters Mr. van Raalten!

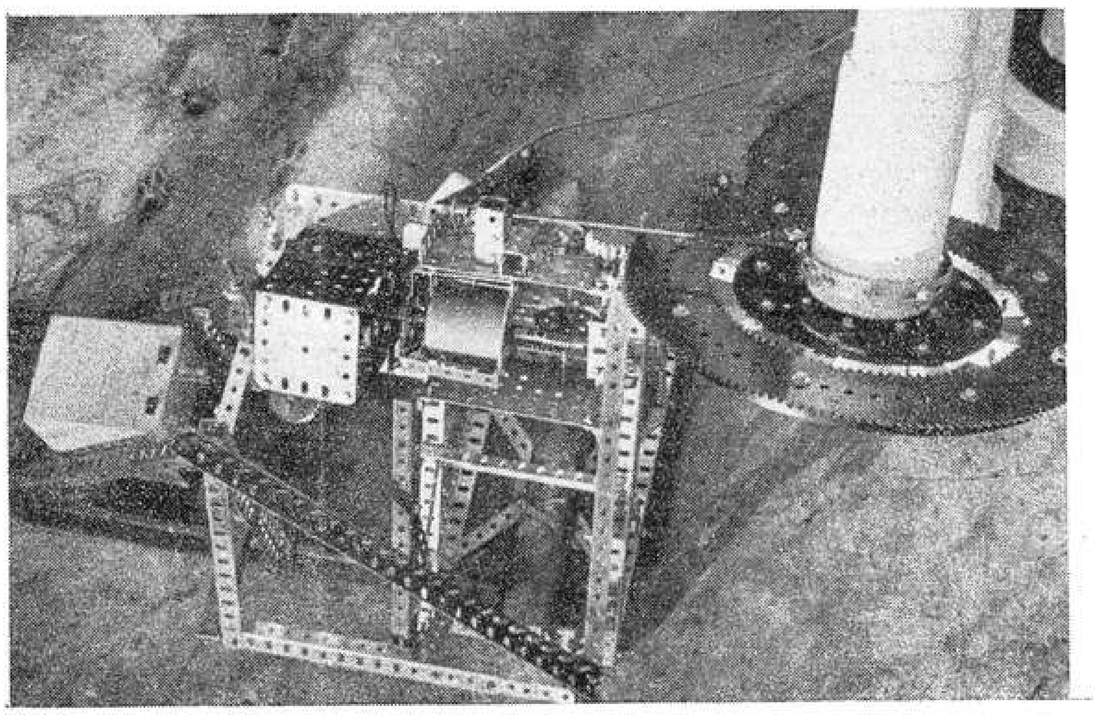
### DIFFERENTIAL ANALYSER

Still on the subject of value, Meccano has long been widely used in industry and research for all sorts of purposes. Many are the pieces of test equipment quickly "knocked-up" out of Meccano parts in the laboratories of industry and many, too, are the machines of modern living, the original prototypes of which incorporated our components to some degree

Generally speaking, of course, such prototypes usually make use of other

**These two illustrations show a device built out of Meccano by Mr. J. van Raalten of De Bilt, Holland. Coupled to his 8" astronomical telescope, it counteracts the rotation of the earth and keeps the telescope pointing at its "target". It makes an excellent example of the value of Meccano in other non-Meccano hobbies.**



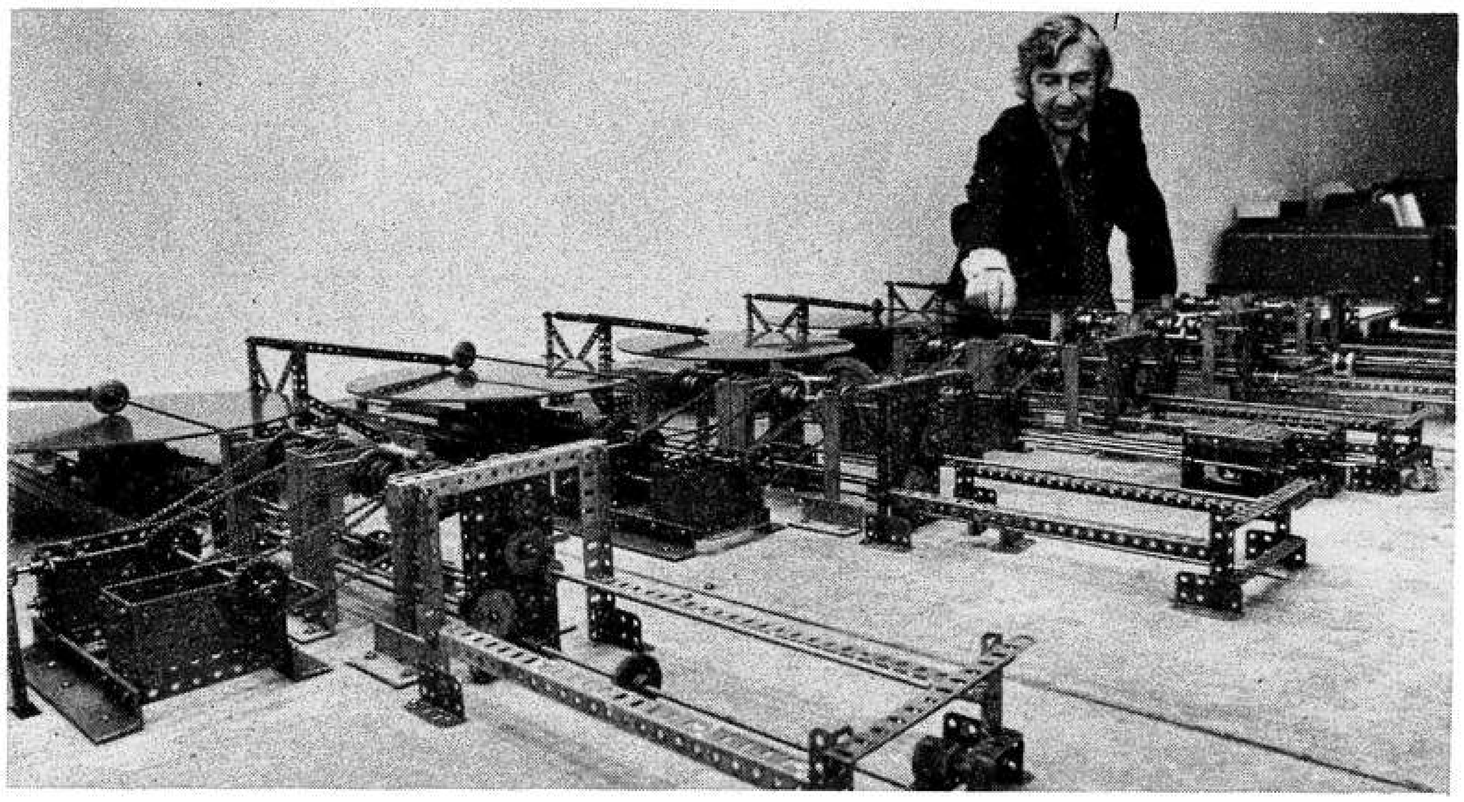


equipment as well as Meccano, but some amazing things have nonetheless been developed with Meccano playing the vital role. To me, the most staggering example of this occurred in 1934 when a Professor D. R. Hartree and a Mr. A. Porter built a Differential Analyser at Manchester University almost entirely out of Meccano. The Differential Analyser – a machine designed to solve complicated mathematical differential equations – is a genuine form of computer and its invention could be said to mark the dawn of the modern computer age. Hartree and Porter did not actually invent the Differential Analyser, but their machine was one of the earliest examples of its type. Particularly significantly, it did for a few paltry pounds what, without Meccano, would have cost hundreds!

All this happened nearly forty years ago and you may wonder why I mention it now, after all this time. Well the reason is simple: the Analyser, or a duplicate of it, has just come to light in New Zealand!

The exact facts are a little hazy, but it seems that Professor Hartree's Meccano computer was so successful in operation that several examples were made, all in the 1930's. One of the machines – I do not know whether or not it was the original version – was taken to New Zealand in 1950 by Dr. H. A. Whale of the Radio Research Centre who had bought it in Britain for £50. Dr. Whale later sold it to the New Zealand Department of Scientific and Industrial Research who used it for several years until they eventually passed it on to the Wellington Polytechnic. It was recently "re-discovered" there, stored away in an old building, and has now gone to the Museum of Transport and Technology at Western Springs where Dr. Whale has been reunited with it. He is restoring it to working order, after which it will be included in a display of computers at the Museum. In fact, it should by now be on display as the computer section of the Museum was due to be opened to the public in mid-July.

I am indebted to Mr. Don Mackenzie, Managing Director of Models (N.Z.) Limited – Meccano's New Zealand distributor – for sending me a cutting from the "New Zealand Herald" giving the story of Dr. Whale and the Differential Analyser and also for sending the New Zealand Herald photograph, reproduced above by kind permission of the newspaper. In the cutting, incidentally, Dr. Whale is reported as believing that the Museum's machine is the sole survivor of the years. I have heard, however, that the first



**Dr. J. H. Whale of New Zealand adjusts part of a Meccano-built Differential Analyser – a type of computer – which was originally produced in England in the 1930's. Dr. Whale is restoring it to working condition for the Museum of Transport and Technology, Western Springs, New Zealand. (Photo reproduced by kind permission of the "New Zealand Herald".)**

Meccano computer *is* still in existence, the property of the Science Museum in London, although I have also heard that the more interesting parts of it have been loaned to I.B.M. in New York. Never having seen the computer myself, I cannot confirm the reports by personal experience, but they came from a reliable source and I see no reason to doubt them. Can any reader throw more light on the subject?

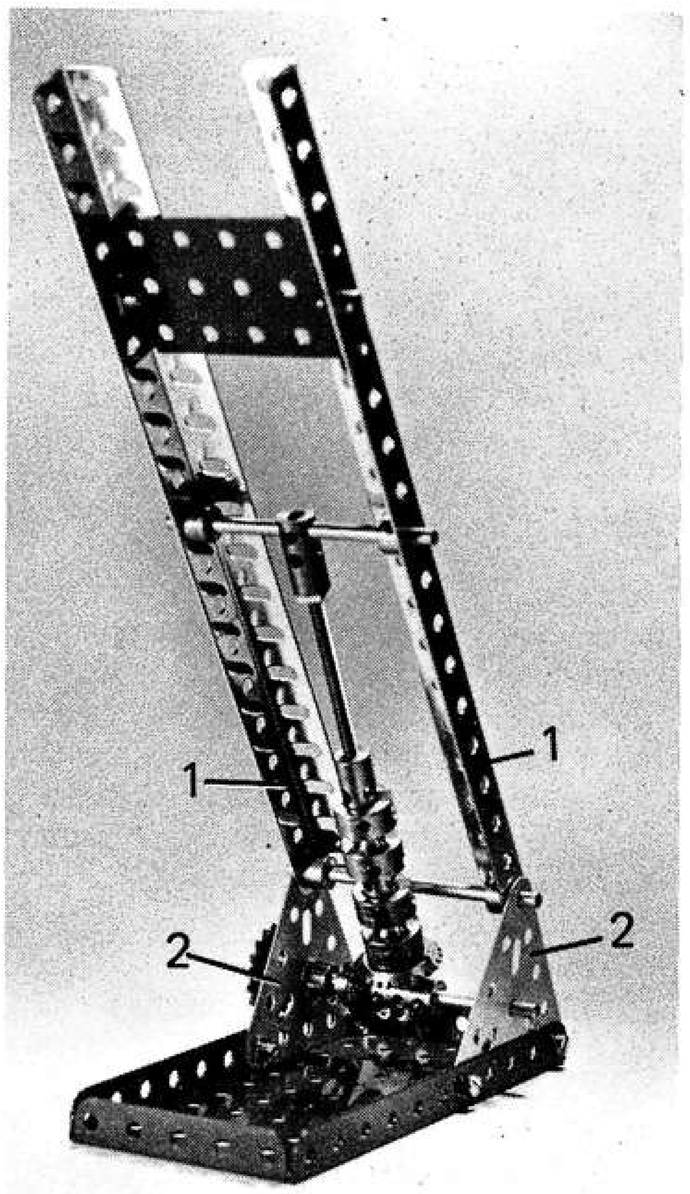
## "HYDRAULIC" RAM UNIT

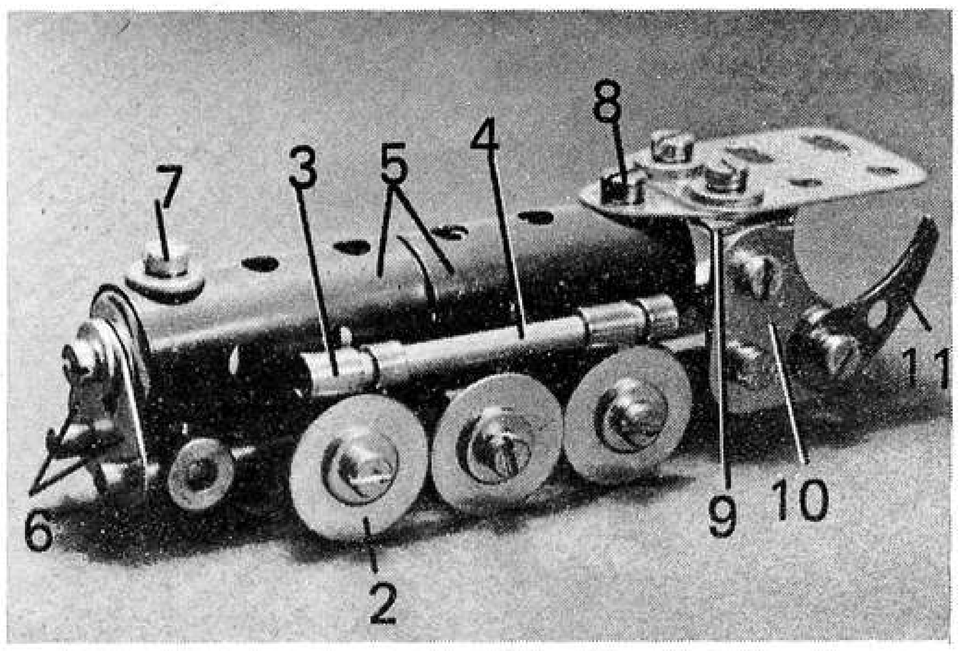
Turning, now, to straight-forward modelling hints, I would like to draw attention to the simulated hydraulic ram mechanism illustrated. It was designed and built by Mr. Pat Lewis who was until last year employed in our Model-building Department, but who is now the Landlord of the Hart's Head Hotel, Giggleswick, Settle, Yorkshire. (Not much difference!) Working on the screw jack principle, the mechanism is extremely positive in operation and imparts a remarkably powerful ram-movement.

When built into a model, of course, the supporting structure for the ram would depend on the design of the parent model, but, for demonstration purposes, Pat has built up a pivotting arm assembly from two 9½" Angle Girders 1 joined by a 2½" x 1½" Flanged Plate. The Girders pivot on a 3" Rod journalled in the apex holes of two 2½" x 2½" Triangular Plates 2 bolted to a 5½" x 2½" Flanged Plate.

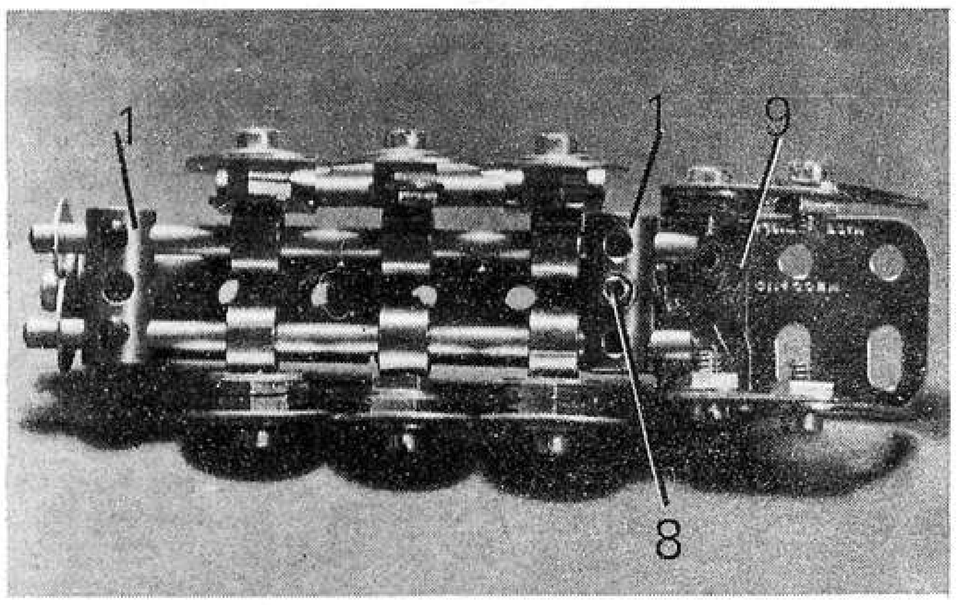
The ram, itself, consists of a Threaded Coupling in the threaded bore of which a 3" Screwed Rod 3 is locked by a Nut. Free to turn on the Screwed Rod is a second Threaded Coupling 4 fixed in one end of a Socket Coupling, in the other end of which an ordinary Coupling 5 is fixed. The lower end of this Coupling is in turn fixed in the upper end of a second Socket Coupling, in the lower end of which a 7/8" Bevel

**A simulated Hydraulic Ram Unit designed by Mr. Pat Lewis of Giggleswick, Settle, Yorks. It is positive in operation and imparts a powerful ram movement.**






**'Simplicity' models are the delight of "Spanner" and very many readers as well. This picture shows a delightful little Steam Locomotive, full credit for which goes to Mr. Roger le Rolland of Stoke - on - Trent, Staffs.**




**An underside view of the Loco showing its simple, yet efficient chassis construction. The chassis is unlocked from the body by slackening the rear centre Grub Screw in right-hand Coupling 1.**

Gear 6 is tightly held. Carried in the boss of this Bevel is a 1½" Rod which is fitted with a Collar and then passed, free, through the centre transverse bore of a Coupling 7, after which it is fitted with a second Collar to hold it in place.

Held in the longitudinal bore of Coupling 7 are two 1½" Rods journalled in the centre holes of Triangular Plates 1. A 7/8" Bevel Gear 8 and a 1" Sprocket Wheel 9 are fixed on one of the Rods, as shown, the Bevel meshing with Bevel 6. Drive is taken to Sprocket Wheel 9. Turning this Sprocket activates the mechanism and causes Rod 3 to screw in, or out, of Coupling 4, depending on the direction of rotation. Carried in the upper transverse bore of the Threaded Coupling on the upper end of Screwed Rod 3 is a 3" Rod 10, journalled in Girders 1. Thus, the movement of the Screwed Rod raises, or lowers the Girders. Sprocket 9 can of course be replaced by any suitable driving component to individual requirements.

**PARTS REQUIRED**

| | | | |
|---|---|---|---|
| 2- 8a | 7-37a | 1-52 | 2-76 |
| 2-16b | 6-37b | 8-59 | 1-80c |
| 3-18a | 4-38 | 2-63 | 1-96 |
| 2-30 | 1-51 | 1-63c | 2-171 |

## SIMPLICITY LOCO

Finally, this month, I would like to take advantage of the fact that *I* am writing this feature to indulge in my own particular delight – a "simplicity" model. As regular readers of the old M.M. will know, I have a special love for these tiny models which use only a few carefully chosen parts and yet which capture the atmosphere of their subjects remarkably well. (The title "simplicity model" was bestowed upon them very many years ago in the mists of M.M. history!) Mr. Roger Le Rolland of Stoke-on-Trent, Staffs, is another man with a similar soft-spot and he has very kindly supplied me with the appealing little Steam Locomotive illustrated here.

A glance at the illustration is sufficient to explain the simplicity description. The chassis consists of only two 3½" Rods held in the end transverse bores of two Couplings 1, positioned one at each end of the Rods with approximately ¼" of Rod protruding. Fixed on each Rod between the Couplings are three Collars, into the outer threaded bore of each of which a 3/8" Bolt is screwed. In the case of the two end Collars, this Bolt carries, in order, an ordinary Washer, a ¾" Washer 2 (representing a wheel), two Nuts and a right-angled Rod and Strip Connector 3. The centre Bolt, however, carries a Washer, a ¾" Washer, a Nut, a Washer and another Nut, but no Rod and Strip Connector. The first two Connectors are joined by a 2" Rod 4.

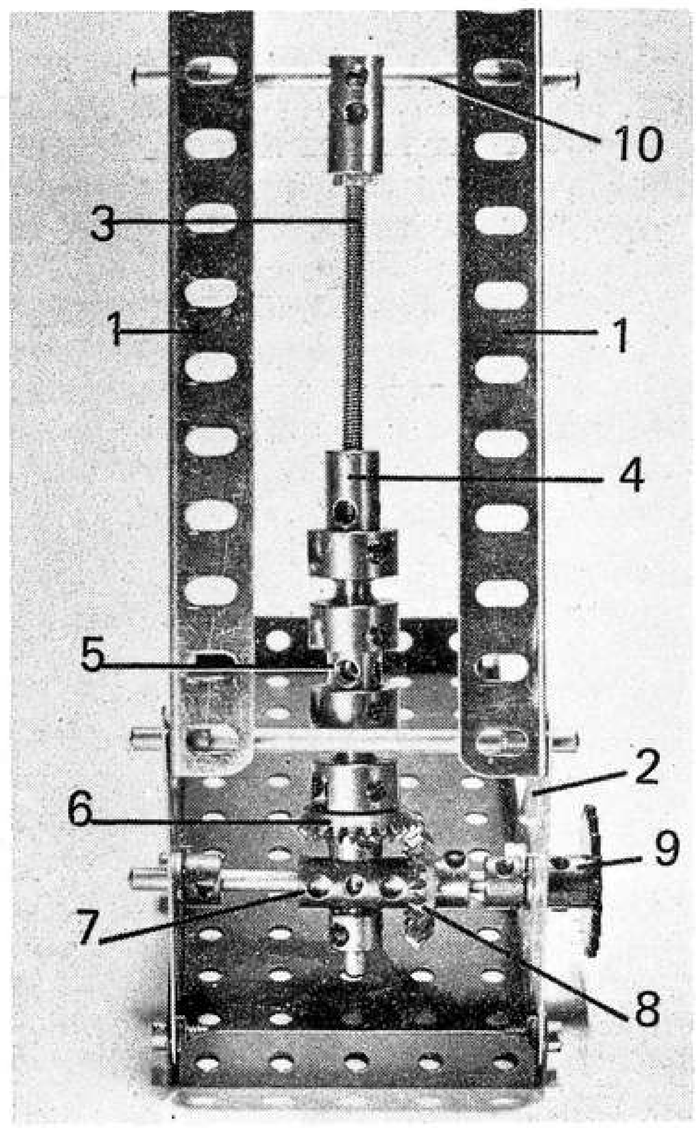
The boiler is provided by two Sleeve Pieces 5, joined by two Chimney Adaptors bolted end-to-end. A third Chimney Adaptor, to which two Fishplates 6 are bolted, is carried in the forward end of the front Sleeve Pieces, the fixing Bolt 7 being fitted with a Washer and serving as the chimney. A 1" Triangular Plate is attached by a 1⅛" Bolt 8 to the top rear of the back Sleeve Piece. Bolted to this is the cab, each side of which consists of a 1" x ½" Angle Bracket 9, a 1" Corner Bracket 10 and a Pawl without Boss 11. The roof is a 1½" Flat Girder.

The Body and chassis are mated by simply locating the forward ends of the chassis Rods into the circular holes of Fishplates 6, at the same time inserting the protruding shank of Bolt 8 into the centre bore of rear Coupling 1, where it is held by a Grub Screw.

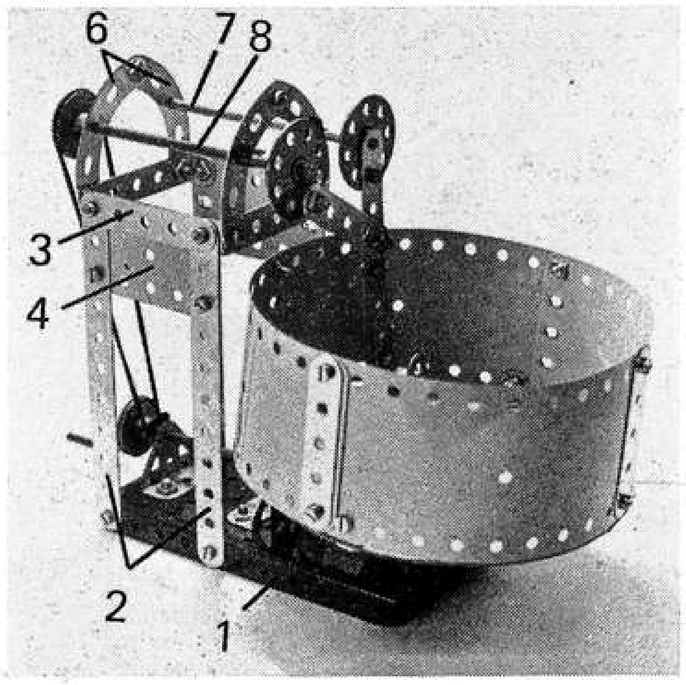
**PARTS REQUIRED.**

| | | | |
|---|---|---|---|
| 2-10 | 11-37b | 1- 77 | 2-147c |
| 2-12b | 11-38 | 1-103h | 2-163 |
| 2-16 | 6-38d | 6-111c | 3-164 |
| 2-17 | 6-59 | 1-111d | 4-212a |
| 24-37a | 2-63 | 2-133a | |

**A close-up view of the simulated Hydraulic Ram Unit designed by Mr. Pat Lewis.**



# MIXING MACHINE




**"Spanner" describes a simple working model.**

AS A GENERAL RULE, models incorporating movement and realistic motion offer considerably more interest to the young Meccano constructor than do "static", or non-working models. In fact, this rule is not limited only to the young, but applies equally well to modellers of all ages – all the Meccano world loves a working model, as you might say, changing the popular quotation somewhat!

The model featured here – a simple Mixing Machine – is a working model in the sense that the mixing bowl revolves and, at the same time, the mixing head swings from side to side to increase "agitation". It should be stressed, however, that, while it goes through the motions, the machine will not of course actually mix anything as a Meccano-built "bowl", with all its holes, is hardly the best thing for holding liquids! Nonetheless, the model includes an interesting movement and, being built from a No. 4 Meccano Set, it makes a useful item for younger modellers to build.

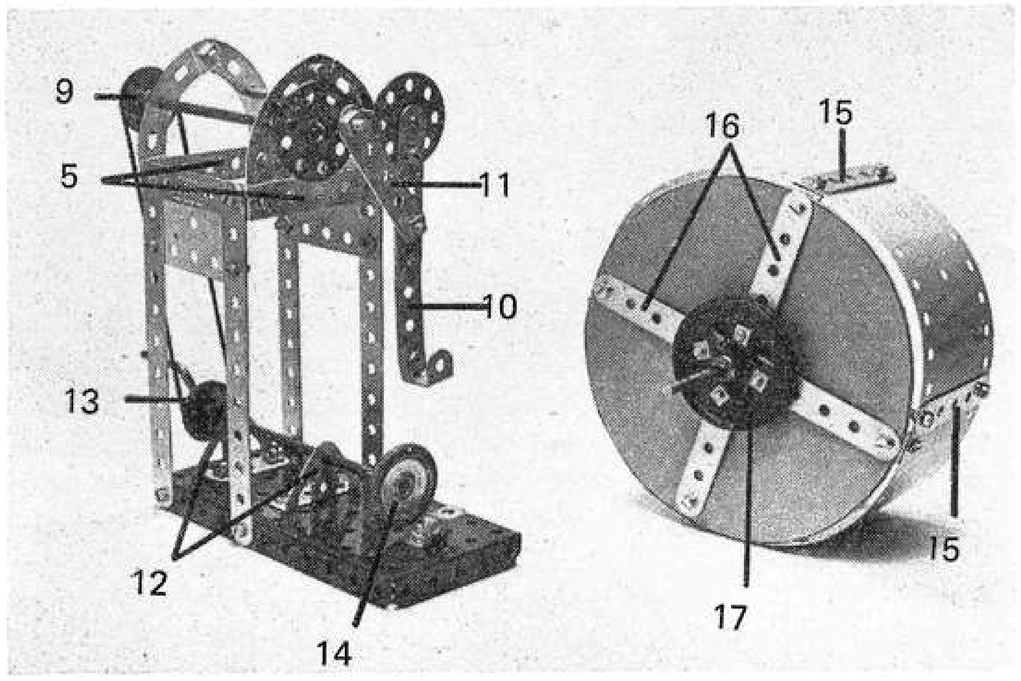
## CONSTRUCTION

Construction is quite straightforward. Bolted to the side flanges of a 5½" x 2½" Flanged Plate 1, in the positions shown, are four 5½" Strips 2, two fixed to one flange and two to the other. The upper ends of the Strips in each of these pairs are connected by a 2½" Strip 3 and a 2½" x 1½" Flexible Plate 4, the topmost securing Bolts in each case also fixing two 2½" x ½" Double Angle Strips 5 between the two pairs of Strips. Bolted to these Double Angle Strips are two arch arrangements, each built up from two 2½" Stepped Curved Strips 6, and in these are journalled two 4" Rods 7 and 8. Rod 7 is held in place by two Spring Clips, while Rod 8 is held by a Spring Clip and a 1" Pulley 9.

Now mounted, one each, on the inner ends of Rods 7 and 8 are two 8-hole Bush Wheels. Tightly fixed to the Bush Wheel on Rod 7 is a 4" compound strip 10, built up from two 2½" Strips overlapped two holes. Note that the upper end hole of this compound strip locates on Rod 7, the strip being fixed to the Bush Wheel by a Bolt which passes through the second hole of the strip and into the face of the Bush Wheel. Lock-nutted between the fourth hole of the compound strip and one hole in the face of the Bush Wheel on Rod 8 is a 2½" Strip 11. This Strip acts as a connecting rod which pushes compound strip 10 backwards and forwards when Rod 8 is turned. A Double Bracket is fixed to the lower end of strip 10 to assist in mixing.

Now bolted to Flanged Plate 1 are two Trunnions 12, the apex holes of which provide journals for a 3½" Crank Handle extended forward by a Rod Connector and a 1" Rod. The Crank Handle is held in place by the Rod Connector and by a Spring Clip and it carries in addition a 1" Pulley 13 which is connected to Pulley 9 by a 10" light Driving Band. Another 1" Pulley 14, fitted with a Rubber Ring, is fixed on the inner end of the 1" Rod.

Turning to the mixing bowl, this is simply built up from two 5½" x 2½" and two 4½" x 2½" Flexible Plates, all overlapping one hole and bolted together to form a large cylinder. The connections are overlayed by 2½" Strips 15. Attached by Angle Brackets to the lower edge of the cylinder are two 5½" Strips 16, crossing each other at right-angles, and although the bowl is only a representation, we also fixed a cardboard disc in place, here, to serve as a base for the bowl. Centrally fixed to the underside of Strips 16 is a 2" Pulley 17, in the boss of which a 2" Rod is tightly held. This Rod locates in the end row centre hole of Flanged Plate 1 and in the spare lug of a ½" Reversed Angle Bracket 18, bolted to the top of the Plate, where it is held by a Spring Clip. The Rubber Ring on Pulley 14 makes contact with the face of Pulley 17 to provide a friction drive system when the operating Crank Handle is turned.




**Heading picture above, a general view of an interesting Mixing Machine built with a No. 4 Set. Left, the Machine and the mixing bowl separated. Note the cardboard disc used as a base for the bowl.**

**PARTS REQUIRED**

| | | | |
|---|---|---|---|
| 6- 2 | 1-19s | 10- 38 | 1-155 |
| 9- 5 | 1-20a | 2- 48a | 1-186a |
| 1-11 | 3-22 | 1- 52 | 2-188 |
| 4-12 | 2-24 | 4- 90a | 2-191 |
| 2-15b | 5-35 | 6-111c | 2-192 |
| 1-17 | 54-37a | 1-125 | 1-212 |
| 1-18b | 50-37b | 2-126 | |

# EXHIBITION EXTRAORDINARY

## Smash Hit at Henley

by C.J. Jelley

IF I hadn't known before, I certainly would have known the moment I arrived in Henley-on-Thames, Oxfordshire, on 31st August last that a Meccano Exhibition was to be held there next day. There were posters everywhere: on lamp posts, in shops, on hoardings, in pubs – even hanging in my hotel! Emblazoned across the front of the Town Hall, imposingly situated at the head of Henley's main shopping street, was a giant banner reading "Meccano Exhibition" and capable of being seen the full length of the street. Nobody could have been unaware of the forthcoming event!

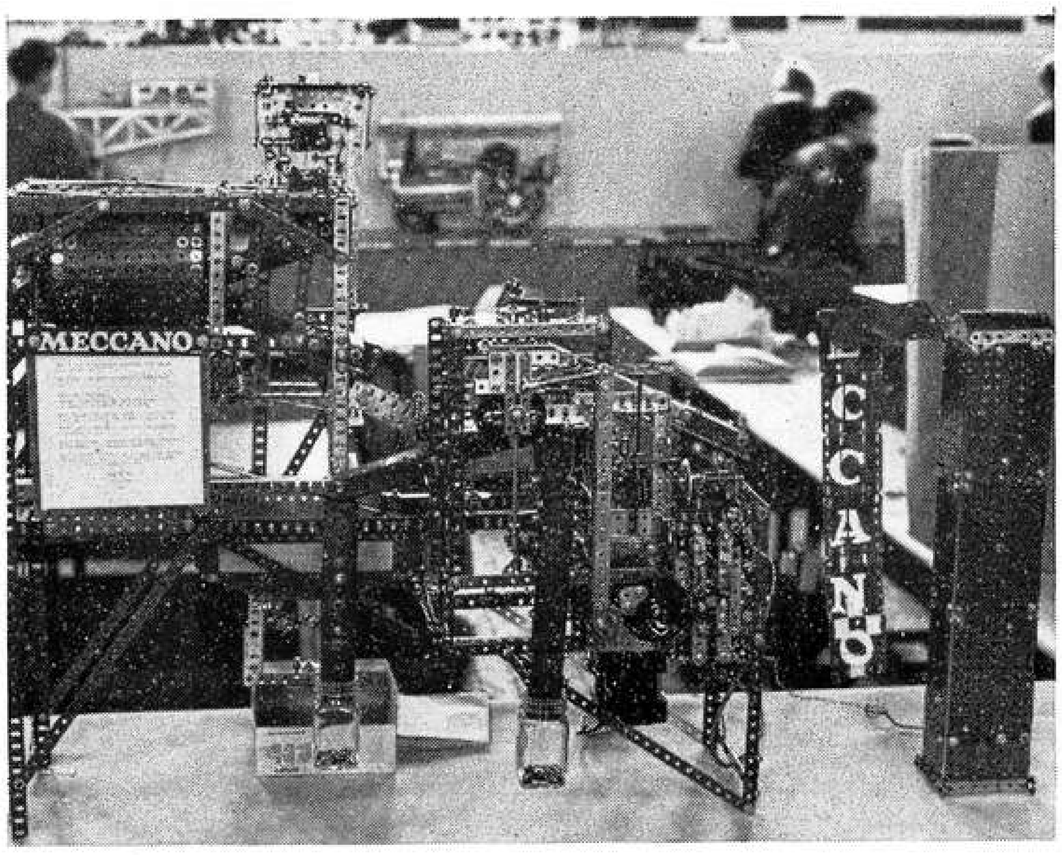
The event in question was the 2nd Annual Meccano Exhibition, a staggering display of "Meccanorama" sponsored by M.W. Models of Henley and organised by Messrs. Geoff Wright, Mike Nicholls and Alf Reeve. Although organised by these gentlemen, however, the exhibition was very much the Meccano Modellers own show. Except for a number of models and a current product display from Meccano Limited, all the other exhibits on show were provided by Meccano Clubs and individual enthusiasts from all over the country. And what exhibits! I did not make an exact count, but there must have been two or three *hundred* models of every conceivable shape, size and choice of subject, ranging from tiny "simplicity" offerings to highly complex and giant masterpieces. There was something to suit everyone, whatever his preference – cranes, orreries, traction engines, locomotives, clocks – you name it and it was there!

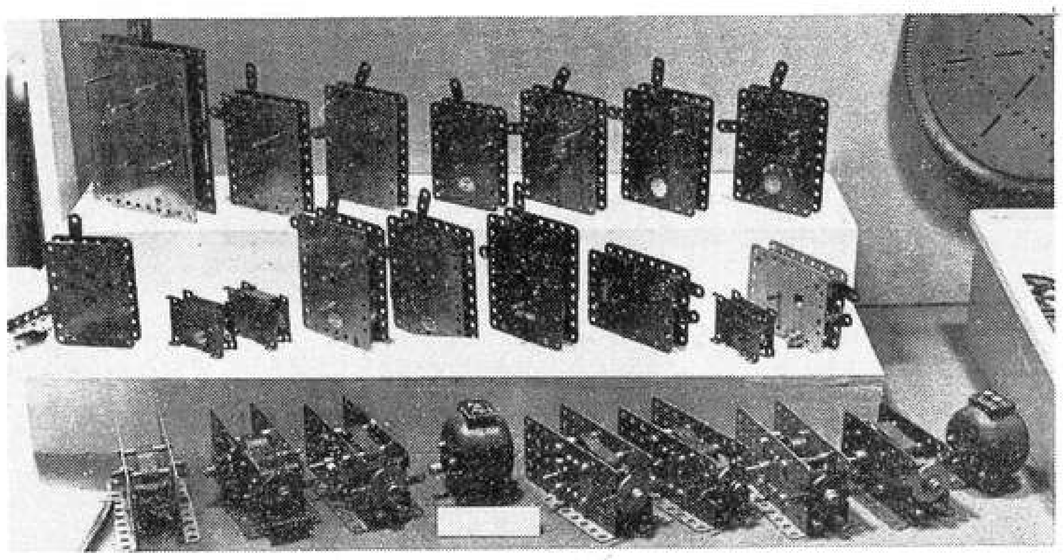
**Above, an outside view of Henley Town Hall the day of the show. Below, part of the crowd inside, soon after opening. It was estimated that 4,500 people attended.**

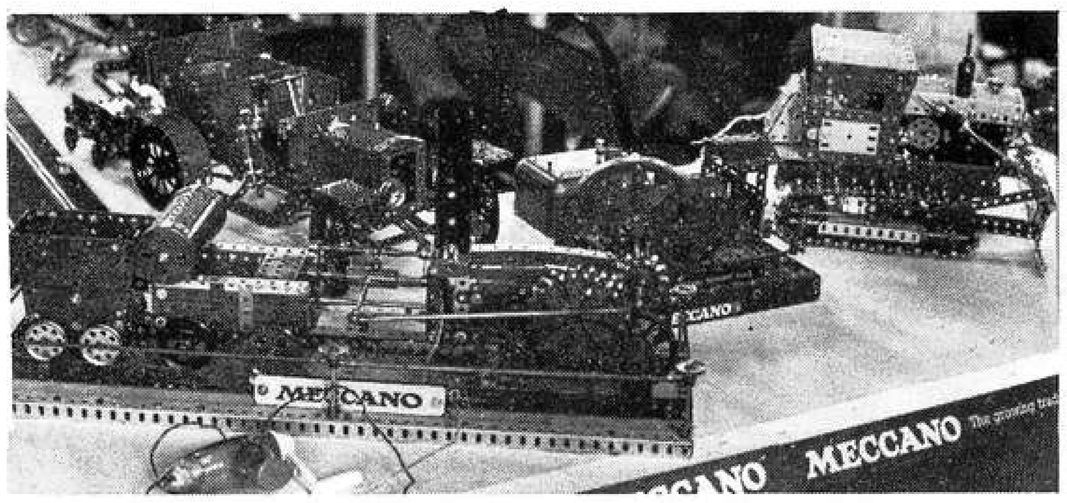
No matter how good the display, an exhibition such as Henley can only be counted a success if it attracts the public and Henley certainly did that! The Hall began to fill up as soon as the doors opened on Saturday (1st September), and it stayed full until the show closed at 6.0 p.m. During the course of the day I popped in and out of the Town Hall several times and each time, I saw visitors queuing to get in. The organisers estimate that, counting exhibitors and visitors, some 4,500 people attended the show which marks an increase of 50% over the first exhibition held last year. A truly remarkable record, this, considering that last year's show was a combined Meccano and model railway exhibition whereas this year, it was devoted exclusively to Meccano Ltd. products, old and new. Two railway layouts were included but these were a vintage Hornby O gauge presented by Brian Wright and a Hornby Dublo layout by Brian Carruthers. Both systems were once made by the Company.

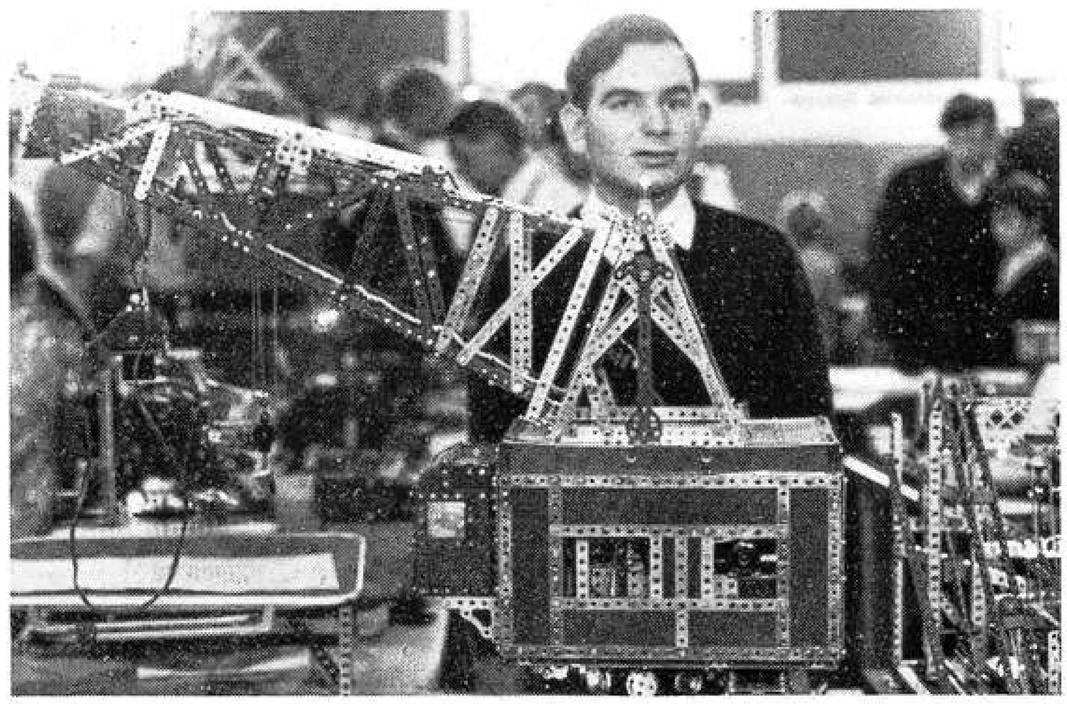
On the Meccano side, the tremendous quantity and variety of the exhibits makes it impossible for me to mention them all in the space available to me here. Indeed, I doubt if any one person could remember them all! I believe it would be unfair to single some models out in preference to other equally deserving cases, therefore I must content myself with one or two general comments on the show. To begin with, the Meccano Clubs really pulled out the stops this year. Large and impressive displays were presented by groups and individuals from the Midlands Meccano Guild, the Stevenage Meccano Club, the Holy Trinity Meccano Club and both junior and senior branches of the Henley Society of Meccano Engineers (The two last branches also played a large part in setting up the whole exhibition).

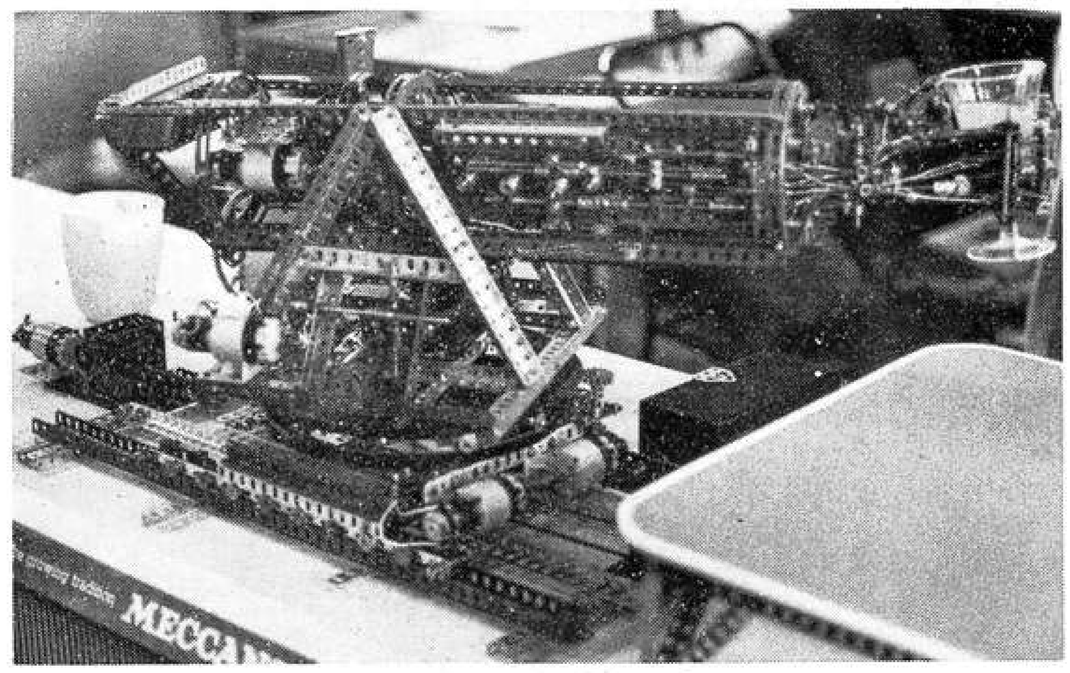
Augmenting the Club displays were numerous excellent models from "independent" enthusiasts and amongst this category I was particularly pleased to meet for the first time Michael Stocks of Lancing, Sussex, a handicapped enthusiast with fine modelling ability in spite of his handicap. Michael was one of the many hard-working exhibitors who spent the whole day giving working demonstrations of their models to visitors and I must say that the patience and dedication shown by these exhibitors is worthy of the very highest praise. It was the demonstrations which, in many visitors, changed casual curiosity into deep interest – even utter amazement at what could be achieved with Meccano.








**A few of the many seen at the show; 1. Fascinating Bolt-sorting Machine by Paul Blythe of Aylesbury which grades bolts according to length. The animated Meccano sign beside it is also Paul's. 2. Just some of the 60 models displayed by the Stevenage M.C. 3. Meccano Motors over the years from Jim Gamble's 'Meccano Collection'. 4. Michael Stocks with his fine Electro-magnetic Grab Crane. 5. An amazing robot Arm and Hand by Tony Homden of the Holy Trinity M.C. Throughout the show, it was picking up a glass of orange juice and pouring it down Tony's throat!**

During the course of the show, two competitions were held for modellers aged 15 and under, one entitled "Transport in the year 2000" and the other for the most original model from a Meccano Multikit. Some first class constructions were entered in both competitions and judging was difficult, so much so that two modellers actually tied for 1st place in the Multikit Contest. Mark Dawes of Bicester, Oxon, was one and Nigel Yule of Fareham, Hants., was the other, Mark's model being a Tracked Transporter with Anti-tank Gun and Nigel's a Tractor, Limber and Field Gun. Each received a No. 3 Meccano Set as a prize. Winner in the Transport 2000 section was Stephen Ashford of Minehead, Somerset, who received a No. 5 Set for a very interesting Helicar. The prizes were presented by Mr. J. D. McHard, Marketing Director of Meccano Limited and Editorial Director of this magazine. Mr. McHard also made a short speech welcoming visitors to the show and particularly thanking exhibitors for putting on such an excellent display.

No report on the show would be complete without mention of the fascinating displays of historic Company products downstairs in the show's Museum Room. Jim Gamble of Kinoulton, Notts., presented his Meccano Collection, the result of eight year's concentrated accumulation of historic Meccano products. The Collection is virtually a museum in itself consisting of a wealth of old and rare equipment stretching back to the earliest days of the Company: Aeroplane and Motor Car Constructor outfits, obsolete Meccano parts, Elektron and Chemex outfits, a complete set of motors, old literature and so on – even the practically unknown Meccano Crystal Set. It's a really fascinating collection, requiring hours of careful study to be fully appreciated.

Also attracting a lot of well-deserved interest in the Museum Room was a Dinky Toys display mounted by Mike Richardson of "Modellers' World" magazine. Using a carefully-chosen selection of models from different years, it traced the development of Dinky Toys from their introduction as "Modelled Miniatures" in 1933 right up to the present day. These tough little miniatures have always attracted me and it is clear from the interest they aroused at Henley that I am only one of many.

The entire Henley Exhibition was an event to remember and my only regret is that, although I took a camera with me, I did not have any flash equipment. As I feared, many of the photographs I took did not turn out sufficiently well for reproduction. but I hope the few reproduced here will at least give some idea of the scope of an excellent show.

# SELF-WINDING UNIT

## described by "Spanner"

## NON-STOP RUNNING FOR CLOCK KITS

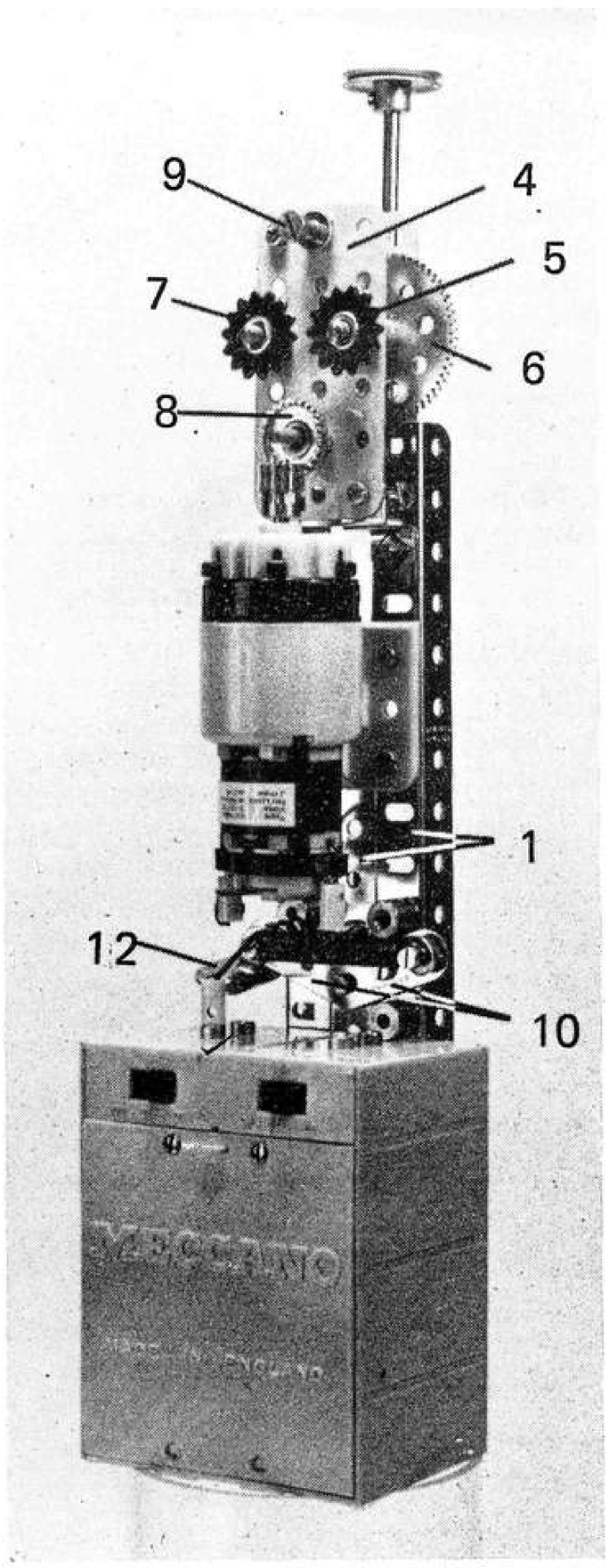
WITH FEW exceptions, the Meccano Clock Kits introduced last year have been very well-received by Meccano enthusiasts the world over. Properly built, they work well and do the job admirably for which they are intended. Indeed, the only noticeable criticism which has been levelled against them – and this by non-Meccano modellers – is that they run for a limited length of time on one winding.

This, of course, is not a criticism levelled by the majority of modellers, who accept that the joy of the Clock Kits is in the personal satisfaction obtained from building and successfully operating a real, working timepiece. They do not expect, nor necessarily want, all the attributes of a professionally-produced chronometer – especially for the price! Nonetheless, it would be foolish to suggest that extra-long running characteristics would not be advantageous and, for this reason, the Unit illustrated here will be of special interest, not only to builders of a Clock Kit, but also to the builder of any weight-driven Meccano Clock. It is a self-winding mechanism which gives non-stop operation for as long as life remains in the batteries.

Our thanks for the mechanism go to leading Meccano expert, Giuseppe Servetti of Piacenza, Italy. Mr. Servetti, in fact, deserves double thanks as, not only did he design the mechanism, but he also built the actual Unit illustrated here specially for the MMQ during an extended visit to Binns Road in July. The Unit can be used with both the No. 1 and the No. 2 Clock although the Clock must first be modified slightly to operate from a Sprocket Chain drive, instead of the original Cord drive. When used with the basic No. 1 Clock, the Winding Unit is sufficiently heavy, as built, to serve as the driving weight, but some extra weight may be necessary if used with the No. 2 Clock.

As regards construction, two 9½" Angle Girders 1 are bolted as shown to a Battery Box, the securing Bolts also fixing two 1½" Strips 2 between the Girders through their second and fourth holes. The opposite ends of the Girders are extended four holes upwards by a 3" x 1½" Flat Plate 3, the securing Bolts in this case passing through the second holes in the Girders and the lower corner holes of the Plate. A second 3½" x 1½" Flat Plate 4 is attached to the first Plate by a ½" Reversed Angle Bracket at the upper left-hand corner only, the lower corners being attached to Girders 1 by further Reversed Angle Brackets.

**Frontal view of the Self-winding Unit by Mr. Servetti of Piacenza, Italy.**




Journalled in the two Flat Plates are three 1½" Rods, two in the third row (from the top) end holes in the Plates and one in the fifth row centre holes. A ¾" Sprocket Wheel 5 and a 60-teeth Gear Wheel 6, the latter positioned between the Plates, are carried on the upper right-hand Rod, as it appears in the photograph, while an idler ¾" Sprocket 7 is mounted on the upper left-hand Rod. The lower Rod carries a ¾" Contrate Wheel 8 and a ¾" Pinion, this Pinion positioned between the Plates and engaging with Gear Wheel 6. A Pivot Bolt 9 is locked in the top row centre hole of the front Flat Plate.

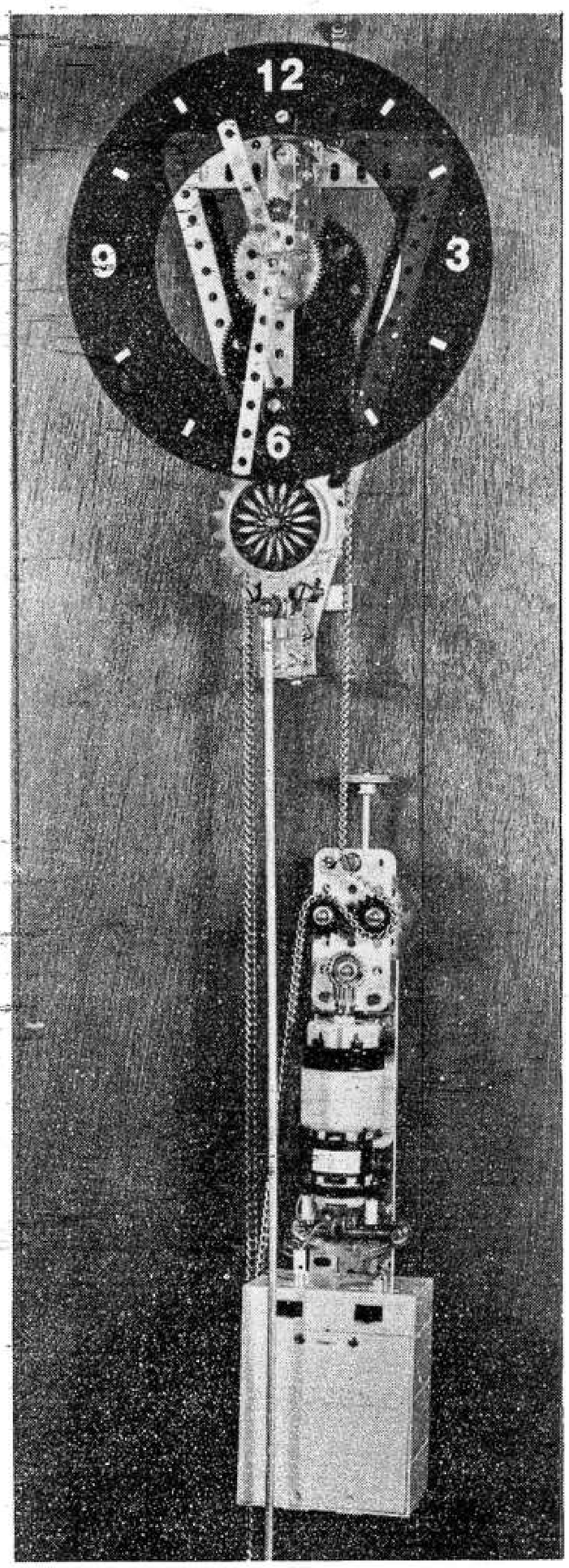
A switch is next built up from two 1½" Strips 10, overlapped one hole and lock-nutted to a 7½" Strip 11, the securing 3/8" Bolt also helping to fix a 1" x ½" Angle Bracket by its end hole in the long lug to the reverse side of the Strip. The short lug of the Bracket faces the upper end of the unit. Strips 10 should pivot freely. Tightly fixed by its short lug to the outer end of left-hand Strip 10 is a second 1" x ½" Angle Bracket 12, this being held in place by two Nuts on the shank of a 3/8" Bolt. The boltshank should not project completely through the inner Nut. Another 3/8" Bolt is held by Nuts in the end hole of right-hand Strip 10 and stretched between this and the left-hand Bolt is a Tension Spring.

A ½" Bolt is held by a Nut in the centre hole of right-hand Strip 1, then the assembly is positioned in the Unit with the shank of this Bolt located free in the ninth hole from the lower end of right-hand Girder 1 and with Strip 11 positioned between both Girders 1 and under Strips 2. Strip 11 should slide up and down in the "guides" provided by Girders 1

and Strips 2 and, as it does so, the movement should activate the switch, causing the lug of Angle Bracket 12 to make or break contact with the inner 12 volt terminal of the Battery Box. Stops to prevent excessive movement of Strips 10 are provided by three Threaded Bosses, two secured to right-hand Girder 1 through its eighth and tenth holes and one to the left-hand Girder through its tenth hole.

Now bolted to the front of Girders 1 through their fifth and seventh holes from the top is a Motor-with-Gearbox, output shaft upwards, the lower securing Bolts also fixing a 1½" Strip behind the Girders to serve as an upper guide for Strip 11. Note that the 1½" Strip is spaced from the Girders by a Washer on each Bolt. Strip 11 is then extended upwards by an 8" Rod fixed in a Rod Socket which is in turn secured to the spare lug of the 1" x ½" Angle Bracket bolted to the back of Strip 10. A 1" Pulley 13 is fixed on the upper end of the Rod, while a 7/16" Pinion is mounted on the output shaft of the motor, this meshing with Contrate Wheel 8. The motor gearbox is set in the 60:1 ratio.

**The Self-winding Unit under operating conditions driving a No. 1 Clock.**



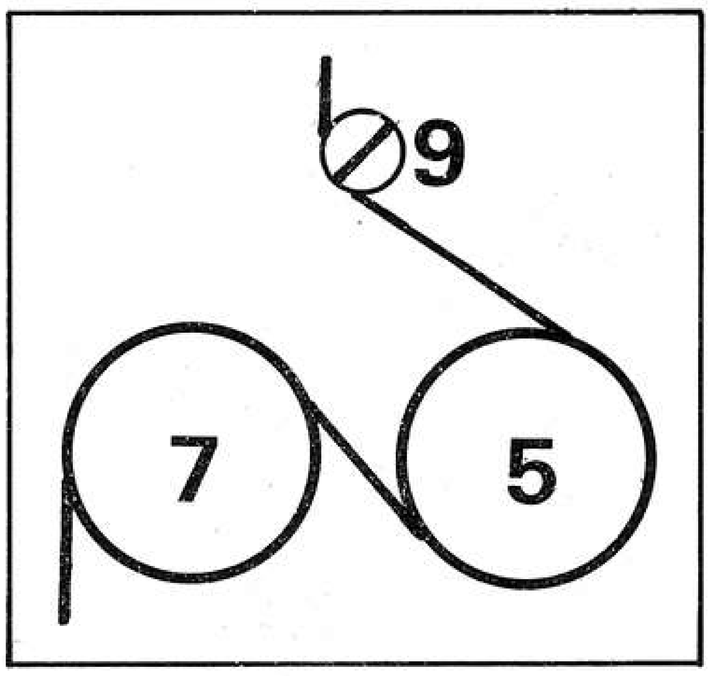

## WIRING AND MOUNTING

Wiring the finished mechanism is the height of simplicity: one motor terminal is earthed by running a wire from it to left-hand Girder 1, while the other motor terminal is connected to the outer 12 volt terminal of the Battery Box.

Setting up for operation is almost as easy. Referring to the No. 1 Clock, for instance, the driving clutch in the Clock is removed and replaced by a 2" Sprocket Wheel. A long and "endless" length of Sprocket chain – sufficient to allow the winding chain to reach the floor – is then looped over this Sprocket and round Pivot Bolt 9 and Sprockets 5 and 7 in the winding Unit. (see accompanying diagram). Finally, a small tensioning weight is provided at the lower end of the chain loop to hold it steady and this can be provided by a 1" Sprocket on a 1" Rod Journalled in the upper ends of two 3½" Strips, between the lower ends of which a number of 2½" Strips are "sandwiched".

In operation, the Unit, because it serves as the clock driving weight, gradually drops as the clock winds down. When it reaches the floor, Strip 11 trips built-up switch 10 which activates the motor and causes the complete Unit to "climb" up the Sprocket Chain. At the top, Pulley 13 makes contact with the clock frame and the motor is switched off. Simple, yet marvellous! It may be necessary, incidentally, to bolt a suitable "buffer" – such as a Plate – to the clock frame to make contact with Pulley 13 in the Winding Unit. And one last point: if the Battery Box is not available, a simple battery container could easily be built up from Meccano Parts to take its place.

**A diagram (representative only) showing method of arranging driving chain.**

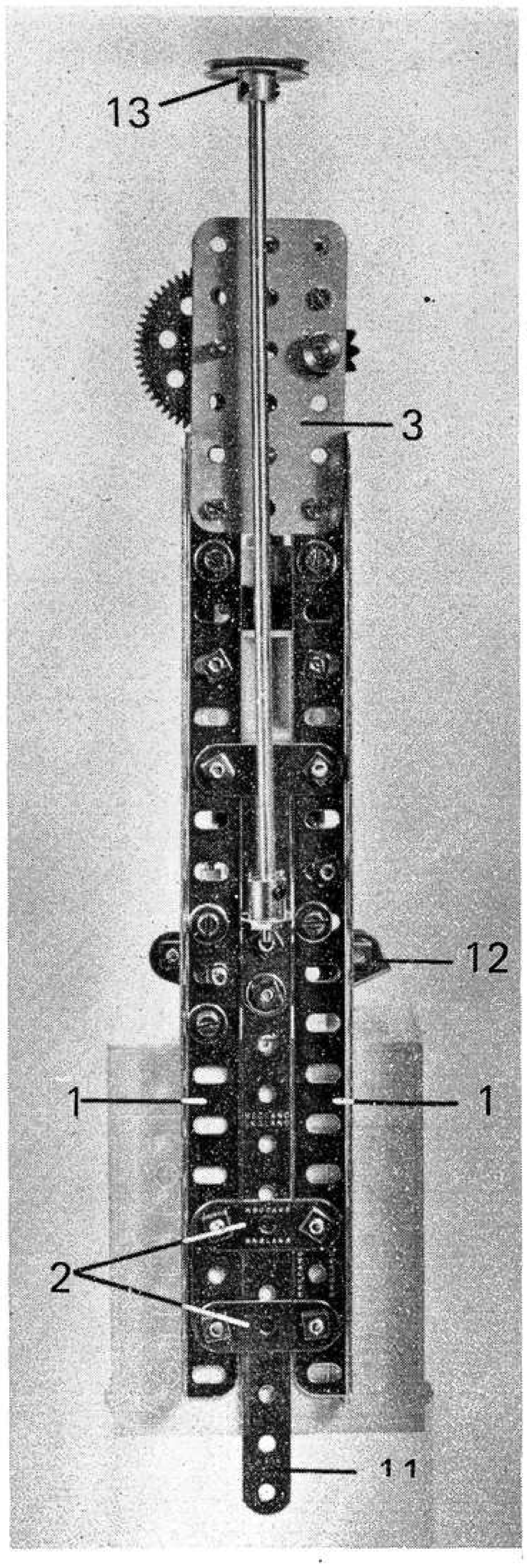



### PARTS REQUIRED

| | | | |
|---|---|---|---|
| 1- 1b | 1-22 | 21-37b | 1-111a |
| 5- 6a | 1-25 | 14-38 | 3-111c |
| 2- 8a | 1-26c | 1-43 | 3-125 |
| 2-12b | 1-27d | 1-59 | 1-179 |
| 1-13a | 1-29 | 3-64 | 3-612 |
| 3-18a | 27-37a | 2-96a | 1-620 |

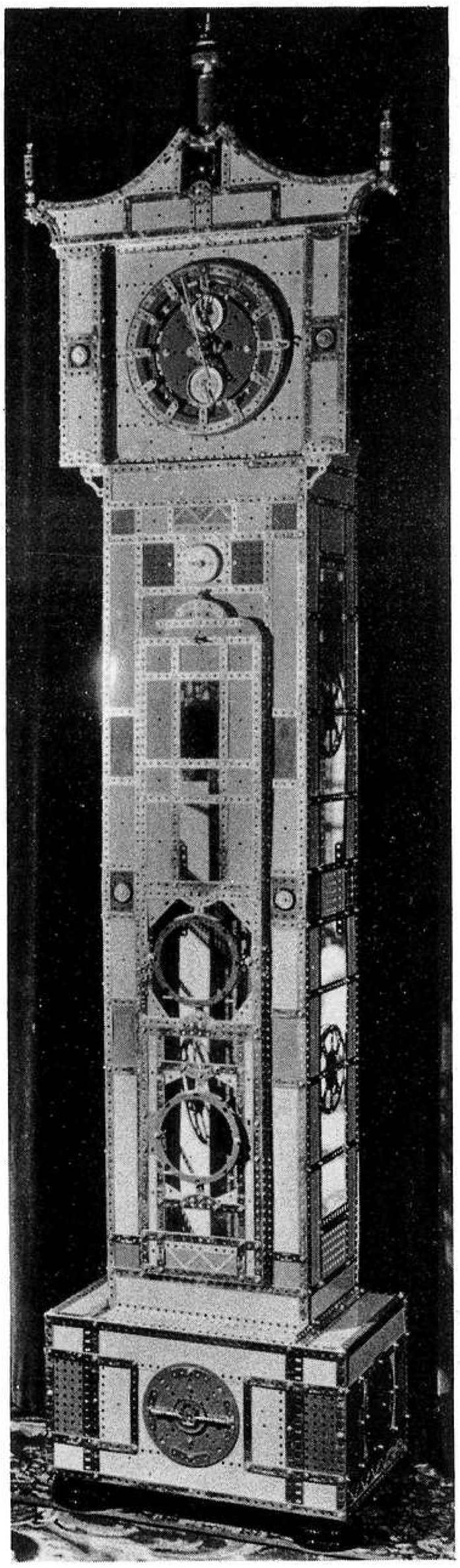
Connecting Wire

**The Unit viewed from the rear. Note Strips 2 holding Strip 11.**



SET 10 MODEL ··· SET 10 MODEL ··· SET 10 MODEL

# GRANDFATHER CLOCK



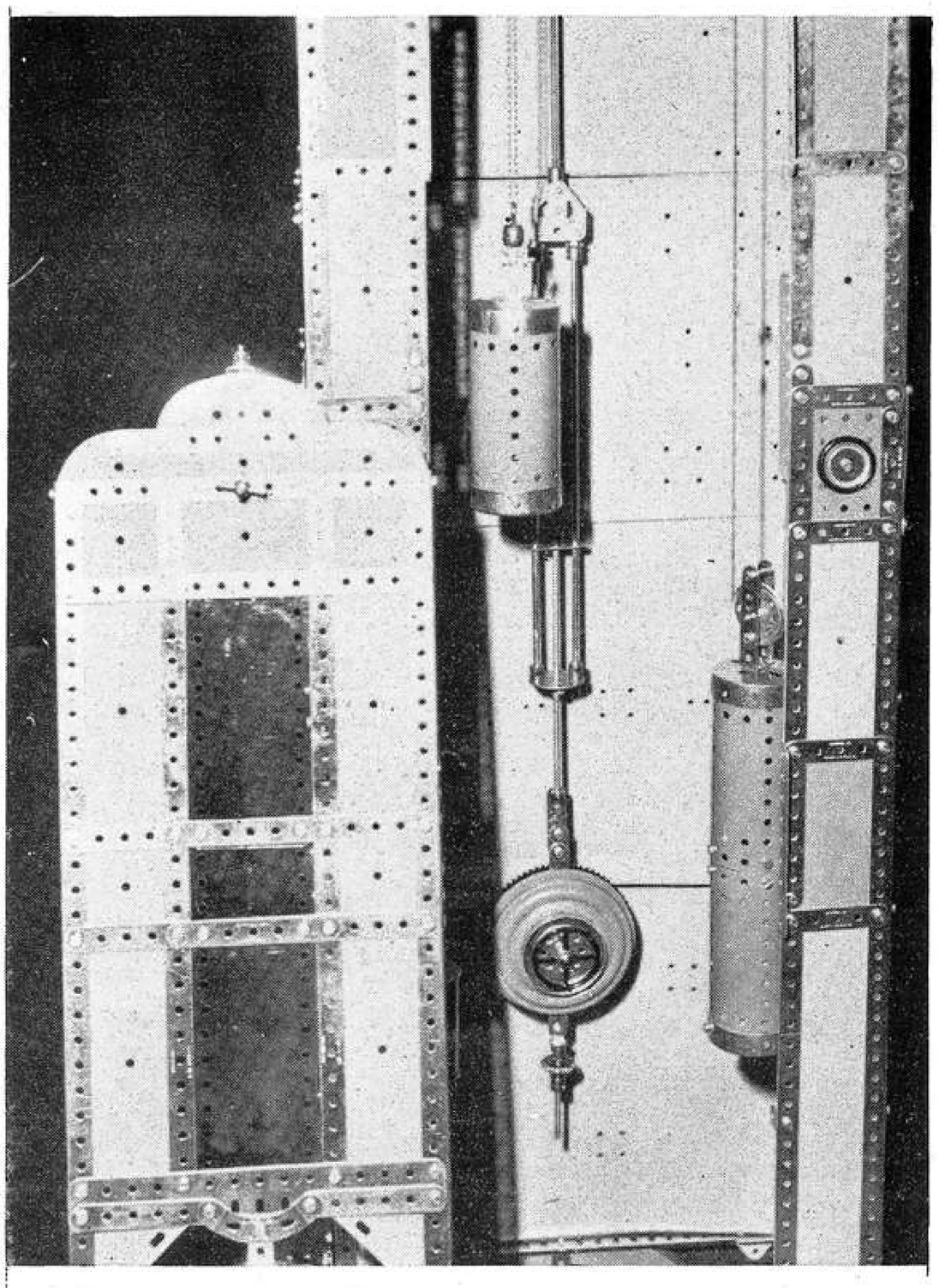
## A new giant timepiece built from the entire contents of a No.10 Meccano Set by B.N. Love

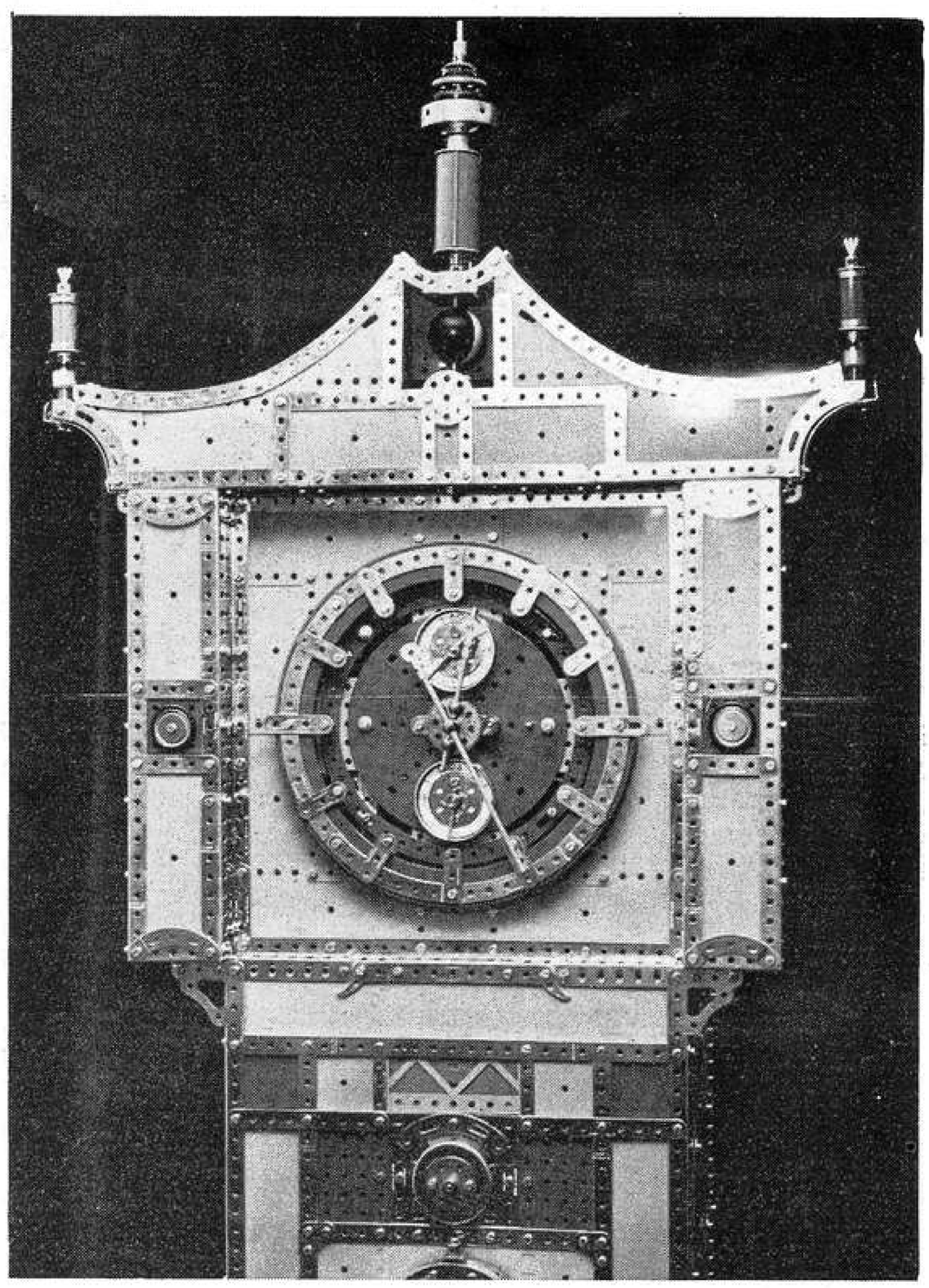
**When Bert Love settled down to design and build the outstanding Grandfather Clock pictured here and on page 64, he determined right from the start to limit himself exclusively to a current standard No. 10 Meccano Set. No matter what problems might arise, he had no intention of moving outside of the set; no extra parts were to be used – even Nuts or Bolts – and yet the clock had to be a true working model.**

Considering Bert was literally starting from scratch, i.e. he was not following any previously-published plans but was designing afresh, he had set himself a pretty formidable task. A model such as he planned would of necessity have to be a large and complex structure and, despite the size of the No. 10 set, the need for an odd "extra" part was likely to be pressing. In the final event, however, Bert succeeded in his original intention – but he used *every single part* in the set to do it! This must be a record in itself as we at Binns Road doubt if there has ever before been an outfit model published which uses every part in the chosen set. (We would certainly like to hear about it if any reader knows of one).

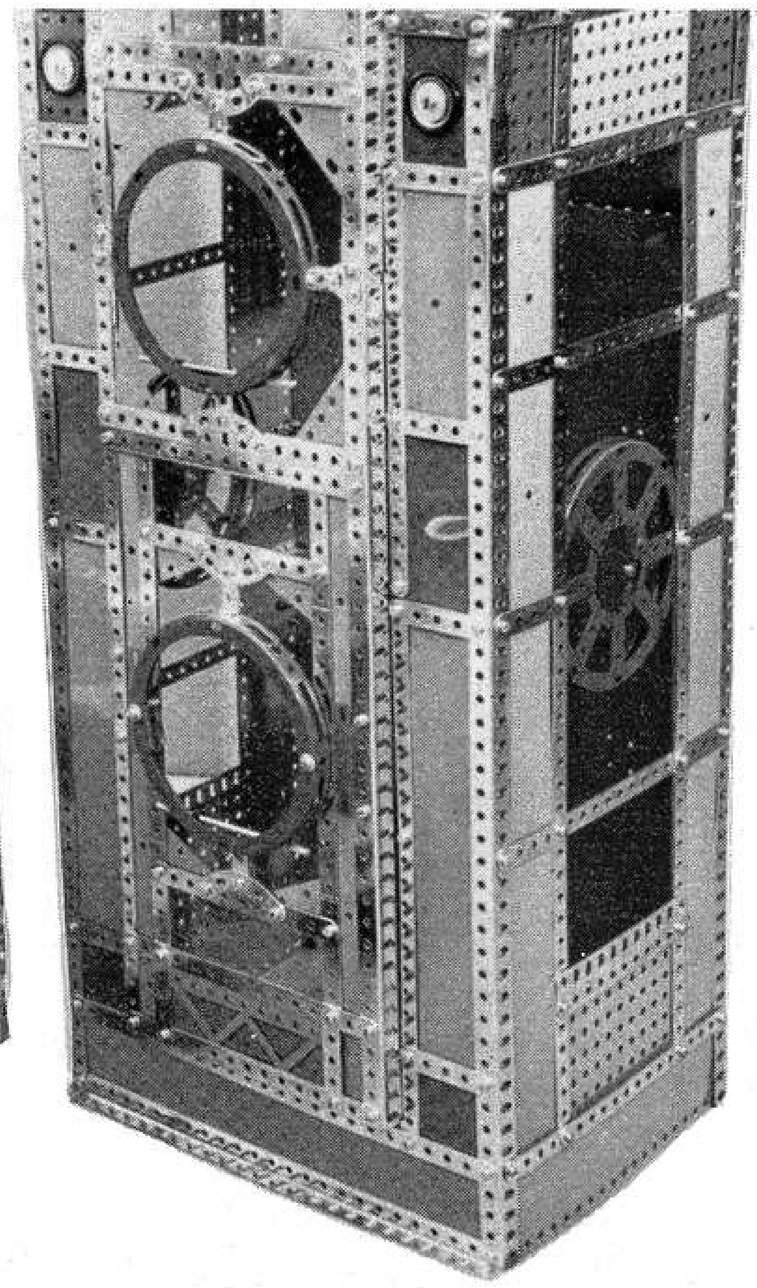
The Clock, itself is a real giant. It stands 7ft. 4in. tall from base to apex, keeps very accurate time and runs for 26 hours on one winding. It includes a fully-maintaining winding drum and, in addition to the normal clock hands, it features extra dials for seconds hand and moon motion. The size and complexity of the Clock, in fact, has caused something of a problem: Mr. Love has supplied us with the accompanying photographs and a full description of his model, but, because so much is involved, we don't have the space to do them both justice!

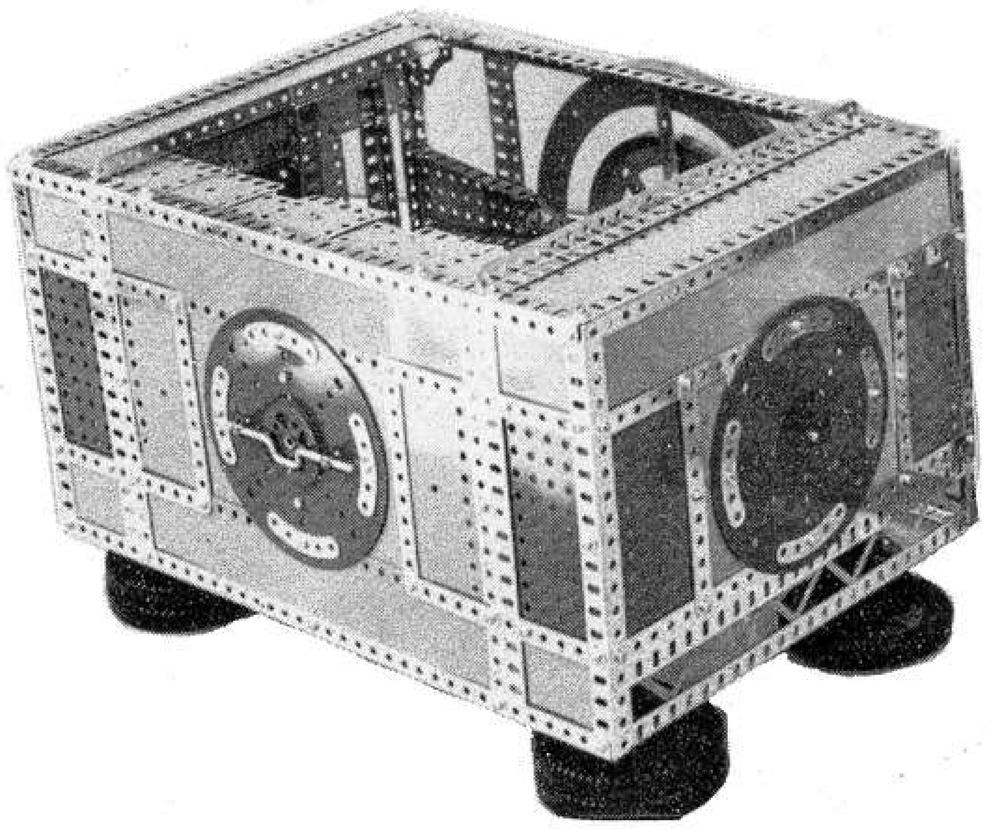
Space in any magazine is limited – and in our's more than most (although, as you may have noticed, we have been able to include an extra four pages in this issue). To have printed the full description would have required considerably more space then we have available, even if the photographs were reduced to postage stamp size, and so we have been forced to compromise. Reproduced here, therefore, are the photographs, but the constructional description has been printed separately for those readers interested in building the model. We will be pleased to supply copies of the description upon request. Send a stamped (3½p. U.K., two International Reply Coupons overseas) self-addressed envelope to: Meccano Magazine Quarterly, P.O. Box No. 4, Binns Road, Liverpool, L13 1DA.





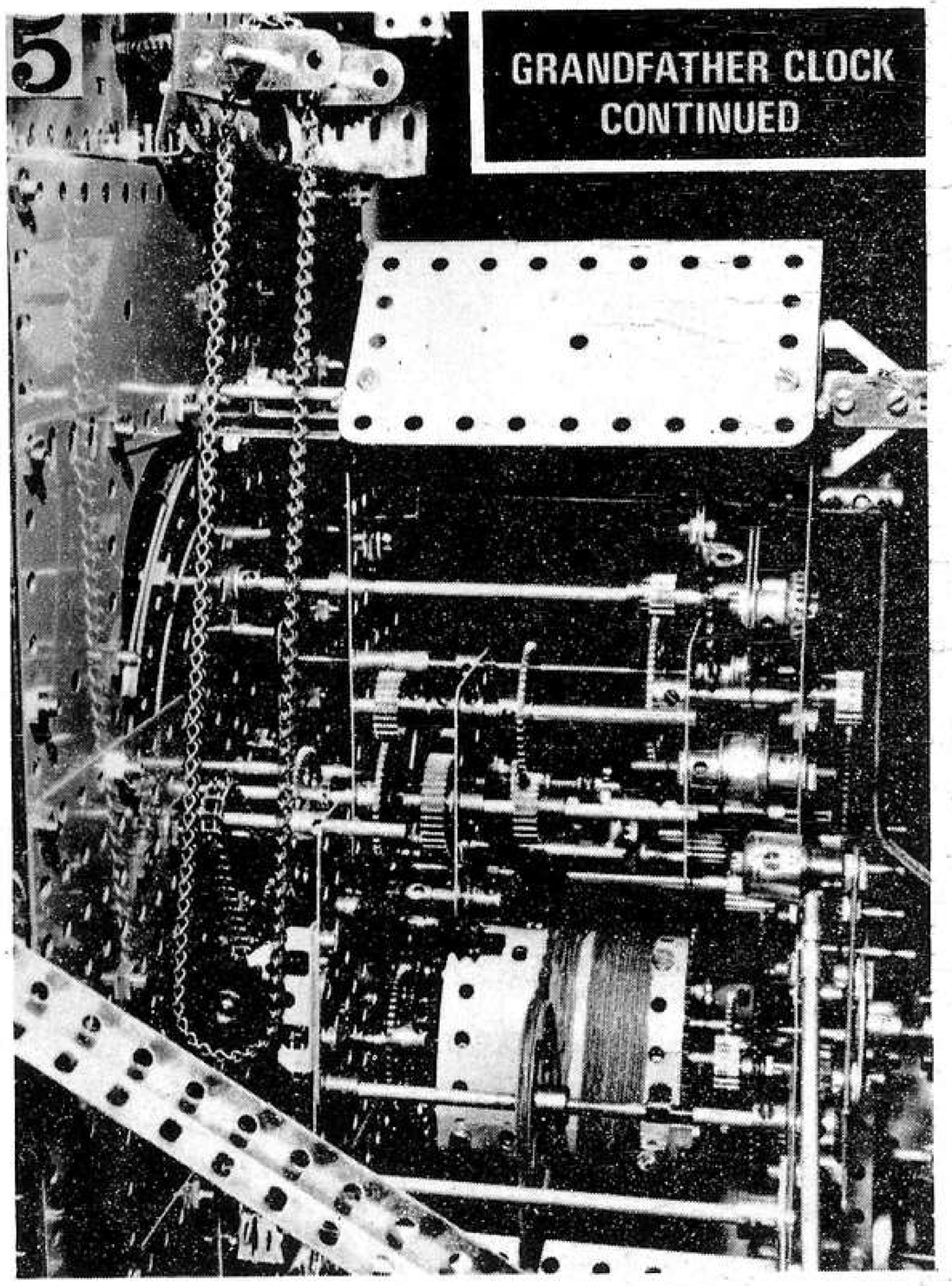
Opposite page: Fig. 1. General view of the No. 10 Set Grandfather Clock. The model stands 7ft. 4in. tall and runs for 26 hours on one winding. Above: Fig. 3. Front panel removed from clock-case to show pendulum and main driving weight. The pendulum has coarse and fine length adjustment. Fig. 4. View of ornamental top showing main and auxiliary dials with moon movement above. Upper small dial shows 24 hour motion. Right: Fig. 2. The clock base unit with lower end of the main clock-case showing general construction. Blue Plastic Plates are combined with yellow Flexible and Strip Plates for symmetrical and contrasting design.

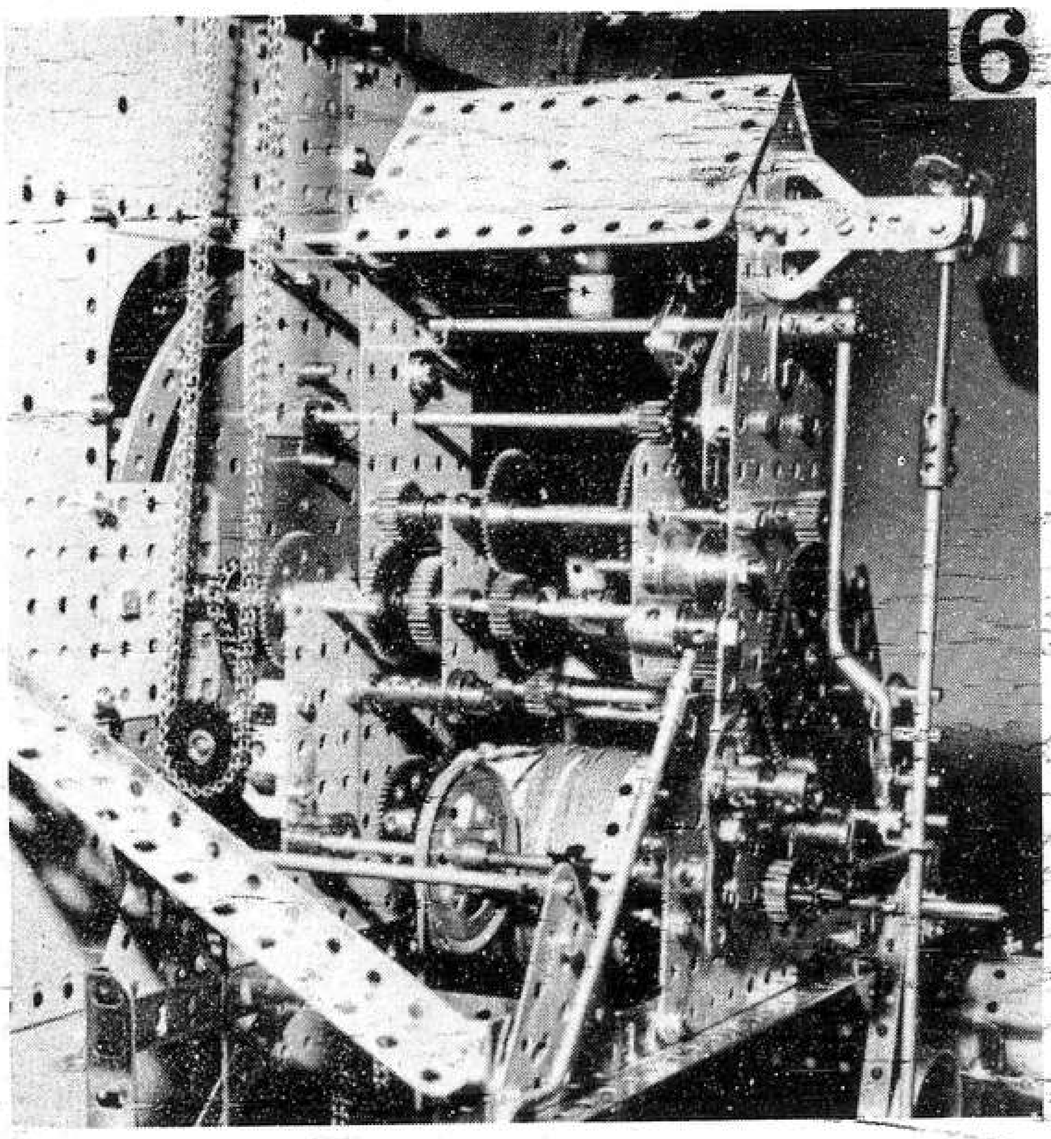


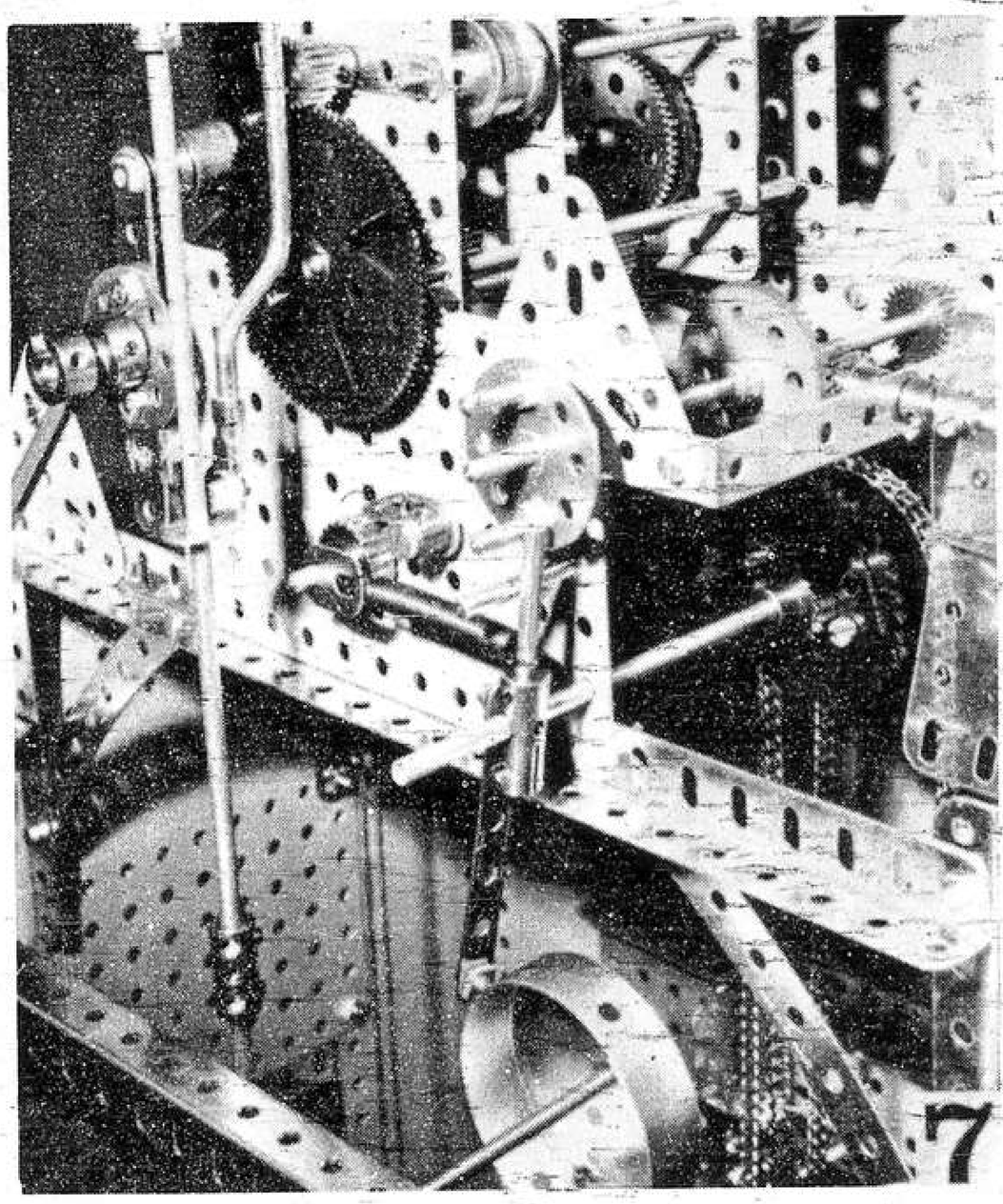


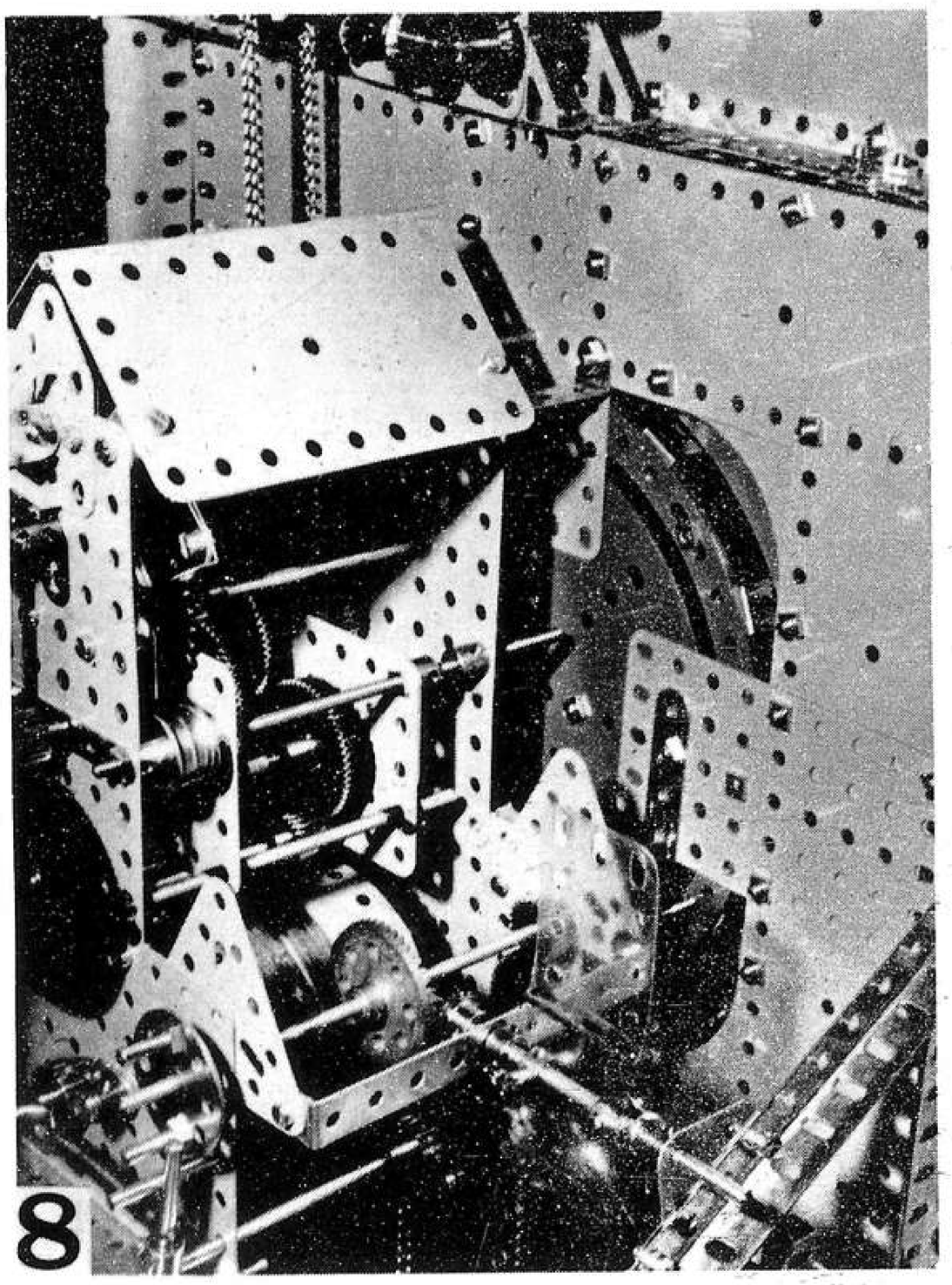
A full description of this model has been written by Mr. Bert Love (pictured on opposite page), but shortage of space prevents us from printing it here. The description has therefore been printed separately and a copy may be obtained direct from our editorial office at Binns Road.

## GRANDFATHER CLOCK CONTINUED




Four more detail views of the Meccano Grandfather Clock by B. N. Love. Fig. 5. Side view of main clock motion showing simple displacement of driving cord by 2" Pulley to put fall of weight clear of the pendulum. Note two strands of Cord twisted together for strength. Fig. 6. Rear view of clock plates showing pendulum crotch, suspension by Flexible Coupling Unit and winding crank in stowed position to the left of the 2½" reduction Gear Wheel. Fig. 7. Chain drive and ratchet wheel strike mechanism for single bell strike on the hour and half-hour. Fig. 8. Bevel drive to air-brake checking speed of simple strike shaft. Note chain and bevel drive above to moon motion.

# RAND REPORT: *MECCANO CLUBS WIN TROPHY*

## From a Transvaal Meccano Guild Newsletter by PETER MATTHEWS

What can I say about the Meccano Exhibition at the Rand Hobbies Fair, Johannesburg, held between the 23rd and 30th June! I think that Marais Spreeth put it in a nutshell when he said "I wouldn't have missed it for anything in the world".

We arrived at the City Hall on Thursday morning with the first truck load of signs, museum exhibits and Cape Town Meccano Club models. Colin Cohen, Pam Venn and Martien De Koster were there to help organise the tables and barriers, etc., so things soon got moving and by late afternoon the exhibition began to take shape. I would like to extend a special thanks to Martien De Koster and Colin Cohen for their invaluable assistance.

When I walked in on Friday morning, I found Marais Spreeth sitting on the floor making up the track for what proved to be the biggest attraction of the show: his 0-6-0 Tank Loco powered by the Meccano Steam Engine. Marais was up from Bloemfontain for the week in true Meccanoman's enthusiastic style. Friday afternoon and evening saw the exhibition really taking shape, people doing the hundred-and-one things that have to be done before the public arrive.

I am pleased to say that we were ready on time. At about 2.30 p.m. Dr. A. D. Bensusan, the Mayor of Johannesburg, opened the Fair. At about 3.0 p.m. the official party entered the Meccano Exhibition and I was introduced to the Mayor and Mayoress, and Edgar Peterson, Chairman of the Johannesburg Round Table No. 3. The Mayor and Mr. Peterson were asked to sign the visitors' book. I then conducted Dr. Bensusan on a tour of the Meccano Exhibition. He expressed his delight at the Exhibition, congratulated us on our efforts and, before he left, wished us all success in our future activities.

Saturday evening saw a packed house and at 9.0 p.m. you couldn't move in the gangways. As far as I was concerned, just the response and excitement of the first day made it all worthwhile, and yet there were another six days to go!

On Tuesday we were visited by Mr. Silberman of Regal Trading – Meccano Limited's South African Distributor. He was absolutely amazed at the enormous display and congratulated us on our magnificent show. Mr. and Mrs. Pat Richards and Mr. Feinstein (Regal Trading) came in the evening and, on the Wednesday, Dr. Sieff, also of Regal Trading, paid us a visit.

Thursday passed without a hitch and, by this time, we had four days running recorded on Marais' Steam Engine. I can't remember the exact mileage at this stage, but, by the end of the week, it had completed 15 miles!

Friday sawyet another visitor from Regal Trading. This time it was Mr. Goodman, the financial wizard. He was given the honour of operating Colin Cohen's magnificent Crane. I must say that I thought Colin's model was the best Meccano-engineered model of the show and a fine example of Meccano building.

Sad to say, the last day was upon us, all to quick, and from all the wonderful reports and congratulations we had received, it is safe to assume that we had provided the sort of entertainment that the public enjoy.

During the entire exhibition much photography, both still and cine, took place. With the idea of making a colour movie of 20 minutes duration, I contacted the Johannesburg Photographic Society. The whole Exhibition was filmed in detail and I am now awaiting a phone call from the photographer for the preview viewing session. Prints of this film will be available, price to be announced later.

While I was doing some filming Les Parrott, the Rand Hobbies Fair Chairman, whispered in my ear that the Meccano Exhibition had won 'The Hector Falconer Floating Trophy' for the most meritorious exhibit of the Show. This was absolutely staggering news and I really was excited. I insisted that all members be on stage for the presentation as the trophy was to be presented to the Transvaal Meccano Guild. Les Parrott presented me with the trophy and, after the usual thanks, I expressed a vote of thanks to Colin Cohen and the Cape Town Meccano Club for their wonderful support at the Exhibition, after which Colin came to the microphone and congratulated me for the organisation of the Show. By sheer luck, I had already bought two bottles of Champagne to celebrate the end of the Show, but now, of course, we really had something to celebrate!

All this was a fitting end to a wonderful seven days that I, for one, will never forget and which I would do all over again (after a short rest!).

*On behalf of MMQ staff and the Management of Meccano Ltd., I would like to offer heartfelt congratulations to the Transvaal Meccano Guild (aided by the Cape Town M.C.) for winning 'The Hector Falconer Floating Trophy' – The Editor.*

### MECCANO PARTS HANDBOOK

A FURTHER addition to "The Meccano Engineers Library" series, published by M.W. Publications of Henley-on-Thames, Oxfordshire, has recently been released. Entitled "Meccano Parts Handbook", it is an extension of the "Meccano Parts Checklist" (which was reviewed in the April issue of the MMQ) and has also been compiled by Mike Nicholls.

Produced in a "landscape" A4 (11¾" x 8¼") format using quality gloss paper, the Handbook is primarily intended to provide the Meccano enthusiast with a comprehensive set of part numbers, descriptions and illustrations of current and obsolete Meccano parts and ancillaries. As well as numerous other items, however, it also gives details of the old Motor Car and Aeroplane Constructor Kits. It contains a wealth of information, and makes both interesting and informative reading for the novice and expert alike.

The Handbook consists of 130 loose pages held together by a strong plastic clip-binder, therefore allowing additional pages to be added in the future when further information becomes available. It can be purchased from M.W. Models, 165 Reading Road, Henley-on-Thames, Oxon., at a cost of £1.50, plus 12p. for postage.

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# DINKY TOYS NEWS

*A look at the new Dinky Toy models released since the last issue of "Meccano Magazine Quarterly".*

Above, No. 295 Atlantean Bus, produced to 1/76th scale. Features include a superbly-detailed casting, glazed windows, seats and a driver representation. Overall finish is in bright yellow with extremely authentic "Yellow Pages" advertising labels on the front, back and sides.

Above, No. 736 Bundesmarine Sea King Helicopter, produced to a scale of 1:103. Features include an electric motor-powered main rotor, a rotatable rear rotor, a "working" finger-operated winch and a fully glazed and upholstered cockpit. Overall finish is in the colours of the German Navy – grey with red engine housing and tail-plane. The rotors are black. Comes complete with a set of waterslide transfers for self-mounting.

Above, No. 731 S.E.P.E.C.A.T. Jaguar, produced to 1/80th. scale and based on the brand new Anglo-French strike aircraft. Features include a clean, crisp, superbly-detailed casting, a retractable tricycle undercarriage and a "working" pilot-ejector mechanism. Finish is in blue and green camouflage colours, with grey fuselage underside. Comes complete with a sheet of waterslide aircraft marking transfers for self-mounting. Spare pilot provided. Below, No. 1006 Ford Escort Mexico Kit. Packed in a book-pack, it contains eighteen components with build-up into a real die-cast Dinky Toy, and includes Speedwheels for improved push-along performance. Kit includes a sample phial of Humbrol enamel, two sets of yellow and white registration plate labels and a sheet of waterslide transfers of the highly-individual Escort Mexico markings.

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# MECCANO CLUB ROUNDUP

**This feature, bringing news from Meccano Clubs around the world, will be included in every edition of the MMQ. We invite all Meccano Clubs to submit regular reports for publication, these being approximately 300 words long. They should reach us, at the latest, by the end of the second month before the month of publication: e.g. reports for the January issue should be in our hands by the end of November. We hope that all Clubs will keep in regular contact.**

## CAPETOWN MECCANO CLUB

We are now an enthusiastic band of nine Meccanomen who have just completed a year that many Meccano enthusiasts will envy.

The highlight of the year was, undoubtedly, a fantastic, all-too-short, seven-day-long exhibition at the Rand Hobbies Fair in Johannesburg during the last week of June. Peter Matthews of the Transvaal Meccano Guild put an enormous amount of effort into the show, and truly deserved "The Hector Falconer Floating Trophy" for the most meritous exhibit of the show.

Tatchel Venn and his wife Pam drove our 34 Meccano models – which helped to make a total of 116 models – from Cape Town to Johannesburg and then back again. It took them two and a half days for the thousand mile journey there, travelling at 45 mph to nurse a suspected big-end bearing, which turned out to be only piston slap!

Peter arranged a Fairground Display of dealers' models which he had borrowed from various shops, and their coloured lights looked very attractive against the black background of the stage on which they were arranged. Congratulations Peter, on an exhibition which must surely qualify for the title of 'The Most Magnificent Show on Earth'!

In March, we held an exhibition of our own, with some 23 models at a Hobbies Fair held in aid of church funds. Tatchel Venn's Robot Man 'Oscar' perambulated tirelessly up and down the floor to please the kiddies, while Kenneth Leibbrandt's magnificent 0-8-0 Class S2 Loco and Tender drew admiration. Richard Schonegevel's reproduction of a Plaiting Machine (M.M. Oct. 1963) created much interest and Reiner Fossati's Money Grabber (Servetti's) hoarded a generous boost to church funds.

Just in time for this exhibition I completed a 1/32nd scale model of the Level-luffing Crane illustrated on the cover and page 438 of M.M. Sept. 1960. The jib is over 5ft. long and it is remote-controlled from an operating console.

We have recently held our Annual General Meeting and, in brief, Michael Alder was re-elected into the chair, I remain as Secretary and my wife, Marion, is taking care of our finances.

We have at last managed to get hold of the Meccano collection from the old Cape Peninsula Meccano Club and have divided this up between ourselves, each receiving something between a Set 9 and 10 plus motors, literature and storage cabinets. This has greatly enhanced our sets.

The future holds in store for us the possibility of two exhibitions, one in aid of Salvation Army funds, and a second combined again with the Transvaal Meccano Guild, this time in Bloemfontein.

Colin Cohen.

## CHRISTCHURCH MECCANO CLUB

To begin my report, I would like to firstly say that all of us here think that the Meccano Magazine Quarterly is really excellent, and that a grand effort has been made by the editorial staff – keep up the good work. *(Glad you like it!* MMQ Staff).

We have been in existence for 44 years now, and competition amongst the novice section of the Club is very keen indeed. Models are well up to standard, and it is so difficult to judge them that we now let every member have his say on models built by both novices and seniors, to make it fairer for everybody concerned. Criticism by different members about other members' models can be quite humerous at times!

One of our Senior members built a model of a Stage Coach which was flown over to England to be displayed at the Meccano Exhibition held at Henley-on-Thames on September 1st.

A novel model built by Mr. Peter Aspear won a previous Senior Competition – it was a Wool Winder powered by a Power Drive Motor. Mr. Neil Pluck built a scale model of his own home from plans which, with great effort, had to be scaled down. Another Senior member, Mr. Wayne Stewart, has been busy repainting his Meccano, and has also built a Morse Key transmitting and receiving set.

Bob Boundy

(At the time of submitting his report in early August, Mr. Boundy and Mr. Pluck were in the process of building a large Showmans Traction Engine for a hobbies display held on 21st August, and organised by the Plunket Society. Powered by a 1/5 h.p. sewing machine motor, Mr. Boundy intended it to pull a trailer carrying his two sons. He was quite confident of a mention in the local press and intended to approach the people from the television. We hope that all went as planned – *MMQ Staff).*

## HENLEY SOCIETY OF MECCANO ENGINEERS

The Henley Society of Meccano Engineers is the newest, mainly-adult Meccano Club to be formed and it now meets on Saturday evenings every couple of months, or so, in Henley.

Meetings are on a friendly, informal basis, and the wide range of models displayed each time stimulates much useful discussion. Film and slide shows have formed the central features of recent meetings, at one of which members were privileged to examine a pre-production sample of a Multikit.

Many members travel considerable distances to be present, and both the President and Chairman of the Midlands Meccano Guild, members of the Guild, and members of the Holy Trinity Meccano Club have been welcomed as visitors. In return, Society members have visited the Stevenage Meccano Club at their stand during the Ongar Exhibition, and have attended Midlands Meccano Guild and Holy Trinity Meccano Club meetings, and also the Midlands Meccano Guild at Stoneleigh showground.

Mid-August saw the formation of the associated "Henley Society of Junior Meccano Engineers" which meets in the afternoon prior to the senior meeting, but members are welcome to stay on for the evening meeting.

September 1st saw both clubs "at home" to the other clubs, and to Meccano modellers generally, at the Henley Meccano Exhibition, and they now look forward to their next meeting date on November 3rd.

Geoff Wright.

(Interested modellers should contact Geoff Wright at 165 Reading Road, Henley-on-Thames, Oxon. – The Editor).

## HENLEY SOCIETY OF JUNIOR MECCANO ENGINEERS

The inaugral meeting of the HSJME was held on the same informal lines as the parent society. Much enthusiasm was shown by the members, and there were many models in evidence. Worthy of note was a Hammerhead Crane built by John Mildenhall and a Steam Excavator built by Peter Simpson. Nigel Robb brought along his Multikit model which is in the course of construction; when completed, the model will have several movements, all operated remotely by working hydraulics.

A discussion was held on the use of Washers in Meccano models and the various tools useful to Meccano engineers, Iain Mitchell (an adult member) then spoke on making small-set models from standard manuals.

A competition was arranged, the prize for which (a complete set of 1960-style Meccano manuals) was donated by Ernest Chandler, the Chairman of the Midlands Meccano Guild, who dropped in on the meeting.

At the Henley Meccano Exhibition, the HSJME had a stand all to themselves, on which many splendid models were displayed. An imposing Wind Generator built by Richard and Andrew Beer topped the display, and a fully automatic reversing Funicular Railway by Paul Smith was amongst the ingenious models displayed on the lower tables. Throughout the day, a member of the HSJME was building a model from a standard No. 4 Outfit, which created great interest amongst the public.

As organiser of the HSJME, I am much encouraged at the success of the inaugural meeting and the exhibition stand. The future of the Junior Society looks very bright indeed, and the Meccano Hobby will, undoubtedly, be maintained at a very high standard by the next generation of Meccano engineers.

Mike Nicholls.

## STEVENAGE MECCANO CLUB

I must begin my report by giving details of an incredible 10 feet high model of the Eiffel Tower built by our Honorary Member. Mr. Roger Le Rolland of Stoke-on-Trent. It has been on display at a garage in Stoke-on-Trent, and, according to Roger, aroused great interest amongst the passers-by. Roger built the tower in four sections, with only a postcard to work from, and all of us at S.M.C. think he has made a wonderful job of it. Still on the subject of towers, our out-of-town member, Jack Farrington, of Cross Keys, Monmouthshire – well known for his Blackpool Tower model which has appeared in the Meccano Magazine (October 1970), travelled round the world, and been on show in Blackpool all this year – has been very busy in Wales exhibiting his fairground models which he really enjoys building.

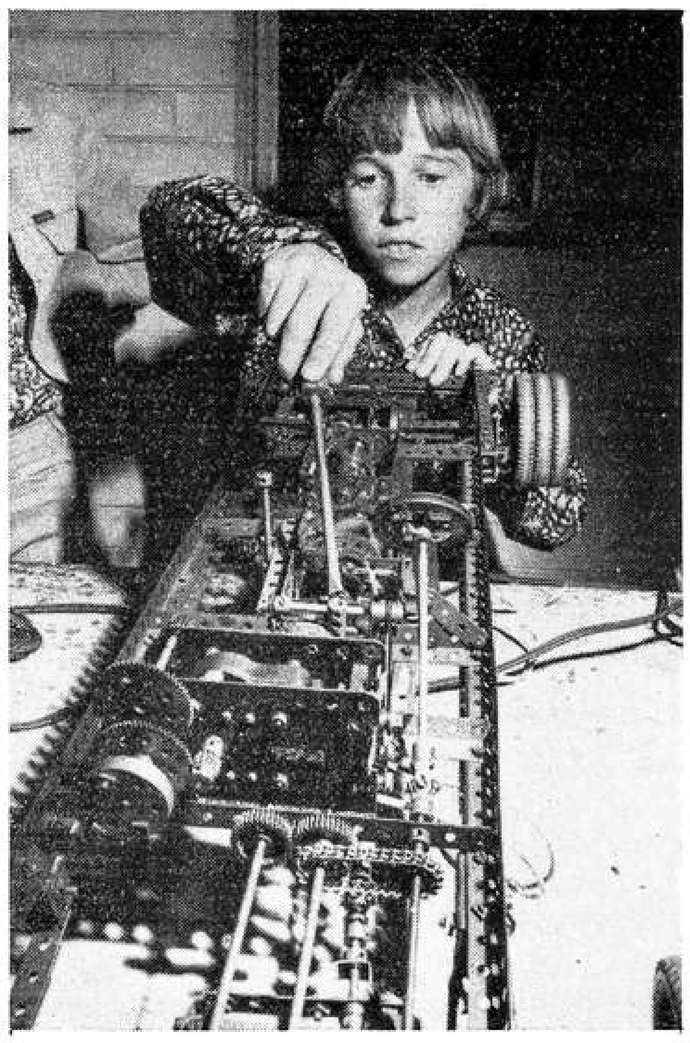
Back at Stevenage, we have had a very busy and exciting year to date, exhibiting our models at a number of schools in and around Stevenage, our largest display being on July 14th at Nobel School where we had 38 models on display. We got a photograph and write-up in a local newspaper, "The Comet", a free copy of which goes to every one of the 80,000 homes in Stevenage. Outstanding models at the display were a tiny Working Robot, built by Stephen Kuc, which delighted the crowds and frightened the dogs, a Ball Bearing Machine built by the lads themselves and a Revolving Crane built from an early Meccano leaflet of the late 30's by Mark Wadeson. Mark made a grand job of the model, and he had only had a Pocket Meccano Set when he joined the S.M.C. last year. Peter Walton and Peter Brown, our first two members when the Club was formed in 1969, also brought along several models, together with models from each member.

The Club has just had the good fortune to obtain a No. 2 Special Aeroplane Construction Set from one of our new adult members, Mr. Alan Daniels from London, to whom go our sincere thanks.

New Club members recently enrolled are: Adults: Alan Daniels of London; Geoff Wright and Mike Nicholls, both of Henley. Boys: Lee and Paul Carpenter, Stephen Aldridge, Stephen Dury and Glen Morris, all of Stevenage.

Dennis Higginson.

**We have no written report from the Maylands Meccano and Hobbies Club, West Australia this issue, but we do have the photograph below. It shows 12 year-old Barry Pierce with the 4-wheel-drive motor chassis which won him his Club's 'Model of the Year' Award as mentioned in 'Roundup' last issue. Barry also won the 'Junior Model-builder of the Year' Award. (Photo reproduced by permission of West Australian Newspapers Ltd.)**



# COLLECTORS' CORNER

by B.N. Love

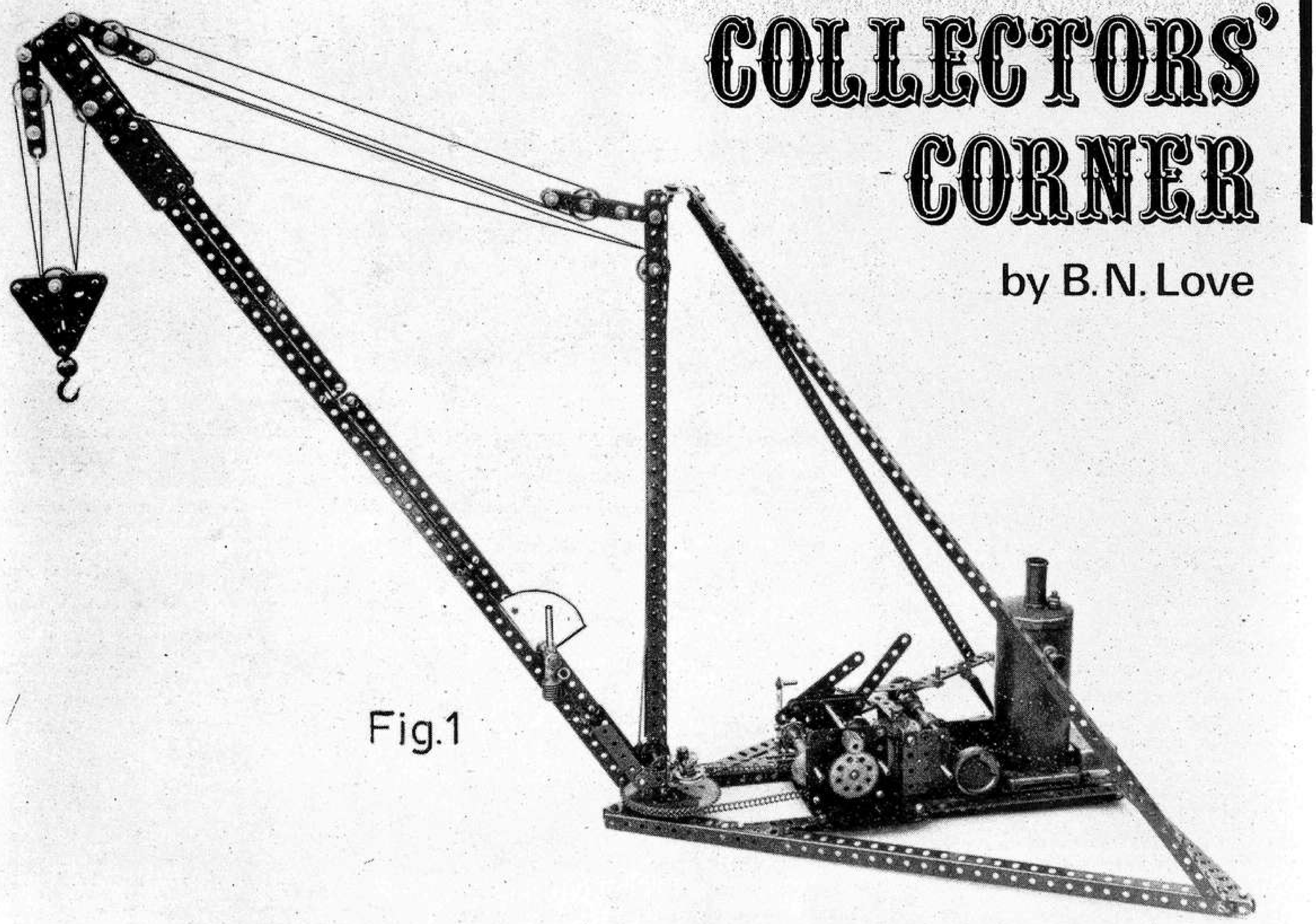


Fig.1

# Super Model No. 6a

## Past Masters 2

**As 'Collectors' Corner' this issue gives full building details for a model which was first designed around 1930, it also qualifies as our second article in the 'Past Masters' series, begun in the July MMQ. We'll have another Past Master for you in January.**

AS PROMISED in the previous edition of MMQ, full instructions for building Super Model No. 6a are presented here. The author would like to make it clear at the outset that all material in this article including text, research, illustrations and the actual model-building is his own work. It is known that an amateur broadsheet for enthusaists did sell theoretical instructions for this model in recent years, but no photographs of an actual built-up model have ever been officially published before, apart from the one shot of the original model on page 15 of the 1930 Steam Engine Manual. This is the sole reference material used by the author.

Older readers of the M.M. who have a fond nostalgia for the early Meccano Super Model Leaflets will not be surprised to learn that SML 6a – also listed as Model No. S30 – has a number of defects in its design and a number of errors in the parts list given with the original single illustration. At the end of this article, a corrected list of parts is given so that those who wish to can make this model, which is really a very simple one. The only obsolete part listed is the Large Loaded Hook – part No. 57b – but the present-day Hook (57c) is of superior design and production in every respect (Any purists may obtain one of the old pattern from the author). Few readers will own an original Meccano Steam Engine, but the latest Binns Road model will directly replace the older engine in this model with virtually no modification to construction.

However, the simplicity of the model is a basis for some of its serious shortcomings, the principal one of

which is the instability of the model. Its base is an equilateral triangle instead of a right-angled triangle so it is very prone to topple. By screwing the model to a substantial baseboard, this defect can be overcome. As we proceed with the building instructions, other design weaknesses will become evident. These should not deter the enthusiast who has an inkling to build the "mystery" SML 6a, but should serve to make him aware of possible disappointments.

## CRANE FRAMEWORK

Beginning with the crane framework, three 18½" Angle Girders are joined up as a triangle with one Nut and Bolt at each corner, the slotted flanges of the Girders horizontal and the round hole flanges to the outside of the base. Choosing one corner of the base apex, a 2½" Strip is bolted between the base sides, five holes back from the apex, to form a simple bearing for the pivot of the crane mast. A pair of 12½" Angle Girders are placed in a parallel line inside the base triangle, slotted flanges horizontal and pointing outwards, and their front ends are bolted to the slotted flanges of the base, nine holes back from the apex. The rear ends of the Girders are bolted in place, fifteen holes in from either corner at the rear of the base – and the base is completed.

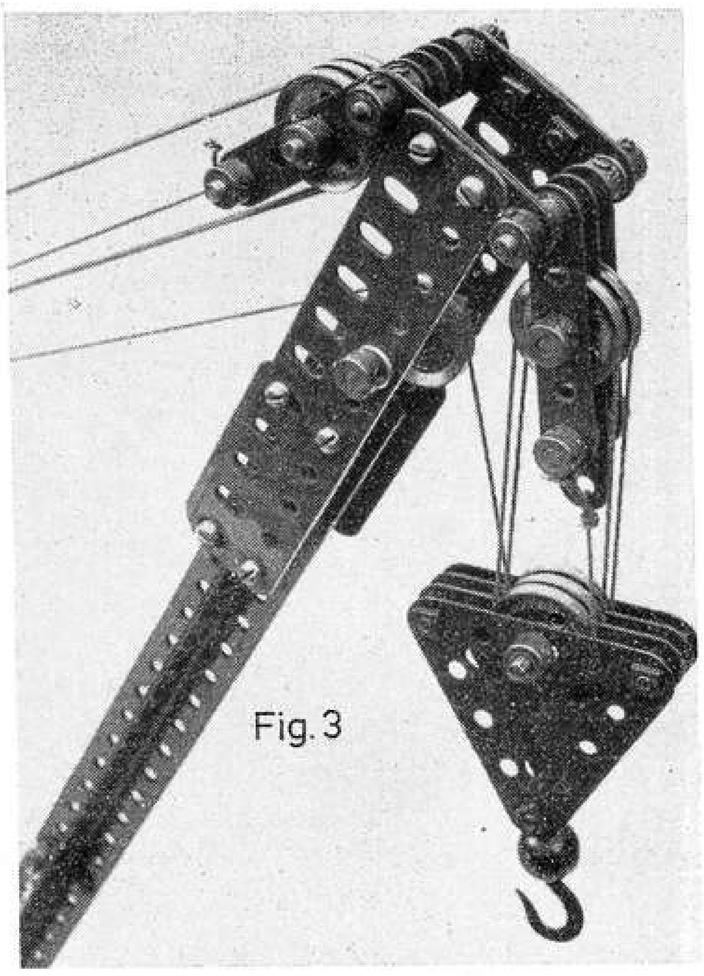
A pair of 24½" Angle Girders form the tie legs of the derrick and these are topped with 2½" Strips, bent to shape as shown in Fig. 2. **Warning:** if enthusiasts attempt to use pre-war parts at this point, they should bear in mind that 1930 stock tends to be rather thicker, but more brittle than current Strips. The author lost three of these original 2½" Strips in the process of bending them, despite years of experience. Moral – use post-war Strips if you are going to bend them! Before attaching the tie legs, make up the crane mast.

## CRANE MAST

Bolted by their round holes to the top and bottom of the pair of 18½" Angle Girders forming the mast are 1½" Angle Girders, as shown in Fig. 1. In addition, at the bottom, the Bolts holding the 1½" Girder, are passed through the mast and into the bottom hole of the Trunnions shown, but a little slack is left on the Nuts at this stage. The Trunnions are now splayed open and a 1½" Rod is entered through the third hole up of the mast, two 1" loose Pulleys, separated by a Washer, being placed on the Rod before it is finally pushed through the other side of the mast. "Padding" Washers may be added to keep the two Pulleys aligned for control and free running. The two Trunnions are now pushed back to the vertical where they will trap the 1½" Rod in place. The securing of these Trunnions is completed by placing 1" x 1" Angle Brackets one hole up from the foot of the mast behind the Trunnions where they form supports for the horizontal guide Pulleys at the rear of the mast, see Fig. 4. A Threaded Pin is fixed in each Bracket to form vertical fixed spindles for the guide Pulleys. The mast is bolted through the slotted flange of the lower 1½" Girder to the face of the 3" Sprocket Wheel, boss downwards, the Girder being centralised over the boss. The Sprocket Wheel is fitted with a 1" Rod.

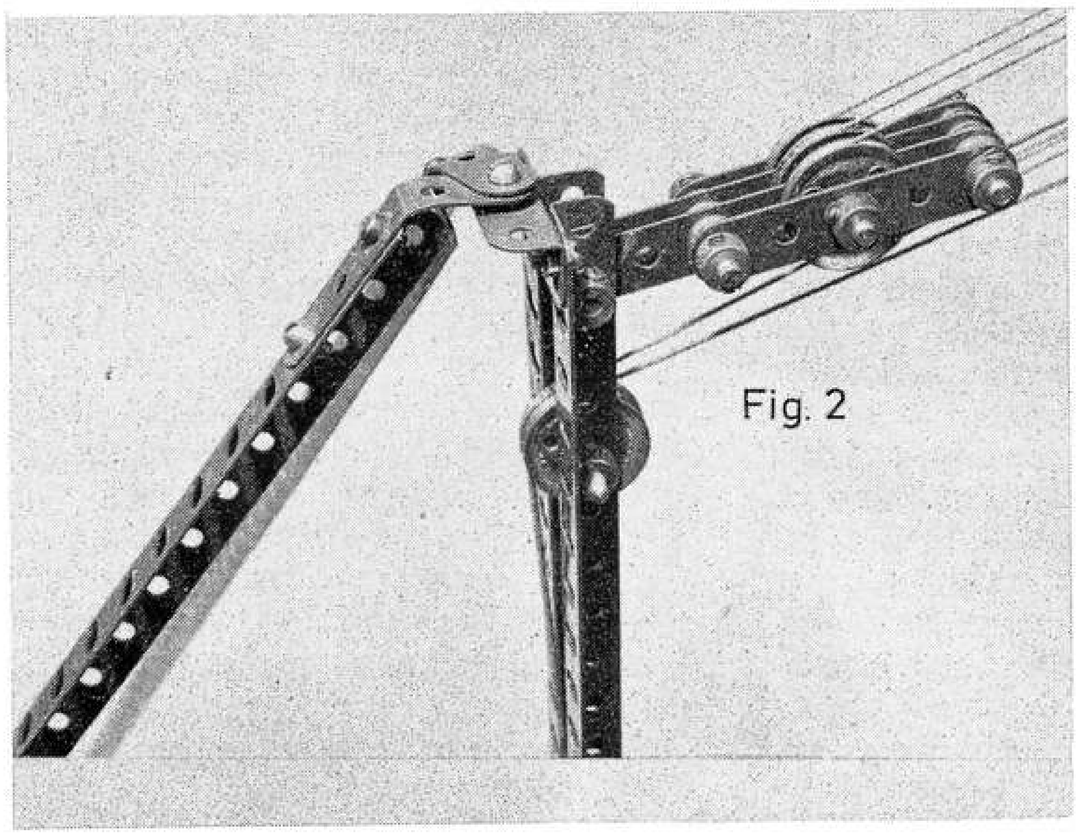
## DERRICK JIB

This is a compound structure having a pair of 24½" Angle Girders below, bolted together by their round holes. A pair of 9½" Angle Girders, similarly joined, are bolted to the 24½" Girders at the upper end and the remaining space below is occupied




**Close-up of jib head. Note double thickness of Flat Girders and 2" Strips to give a rigid structure.**

by a pair of 12½" Girders and finally a pair of 2½" Girders. These last Girders, however, are fitted with their round hole flanges outwards and are set at a width to enter between the Trunnions at the foot of the mast with just a little clearance. Later, the jib will pivot at this point on a 2" Axle Rod trapped in place by internal Collars. To give these clearance, the two 2½" Angle Girders at the base of the jib are bolted in place at their lower ends one hole up from their tips. The jib head is reinforced by using double layers of 5½" Flat Girders fixed by four 2½" Angle Girders at the lower end to the top of the compound jib girder, one set of 2½" Girders above and one set below. Again, double 2" Strips provide strong journals for the jib head blocks and these are bolted to the extreme ends of the 5½" Flat Girders as shown in Fig. 3.

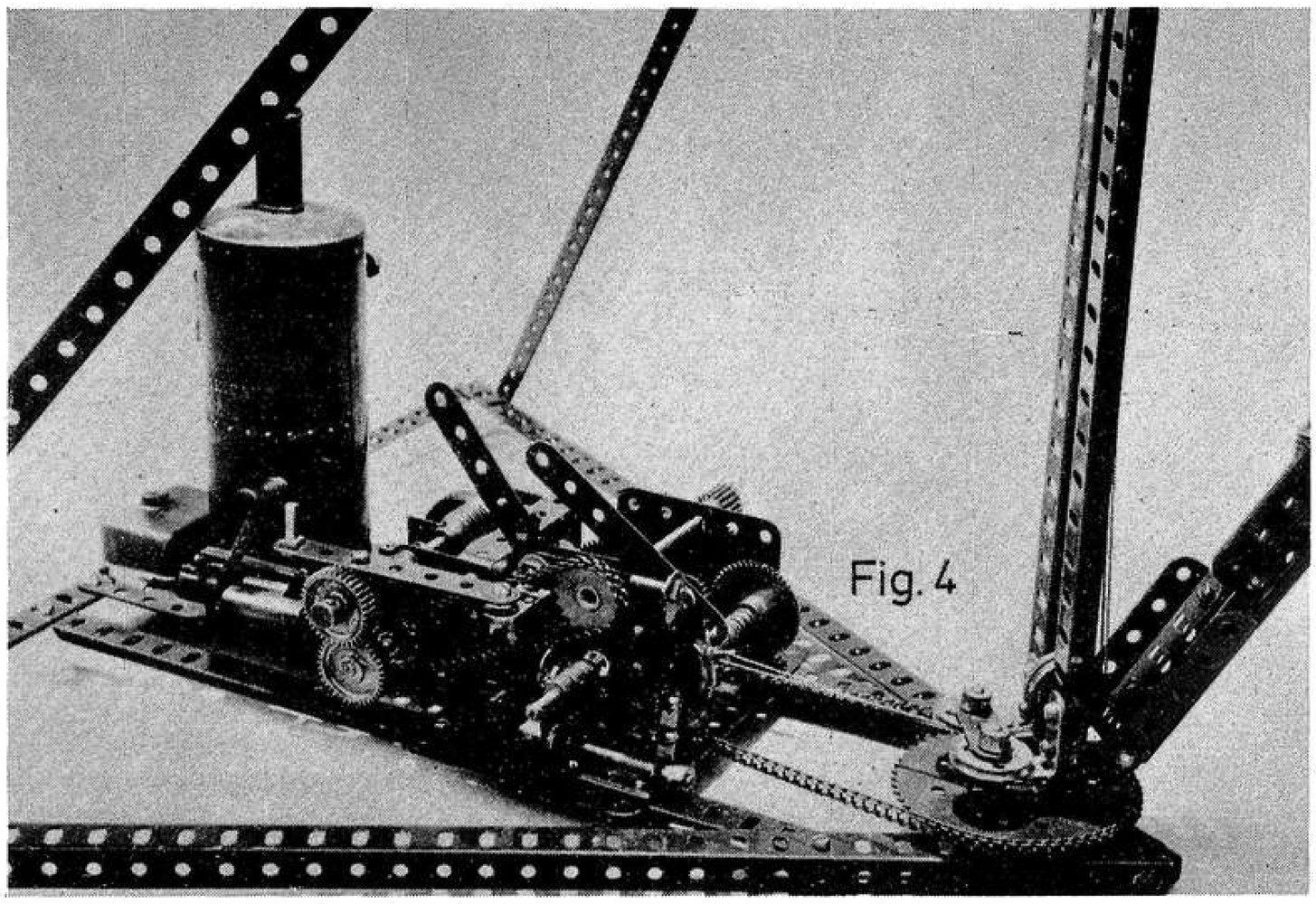



**Opposite page, a general view of the "mystery" Super Model No. 6a – Steam-driven Stiff Leg Derrick, circa 1930. The jib radius indicator is a Standard Mechanism. Left, a close-up of the mast head pivot and luffing block.**

## STEAM ENGINE MOUNTING AND PRIMARY GEARING

Counting six holes back from the front ends of the parallel 12½" Girders in the base, a 5½" x 3½" Flat Plate is bolted in place as shown in Fig. 4. As the 1930 Steam Engine has an off-set base, the near side in Fig. 4. is bolted 17 holes in from the left rear while the far side is bolted 16 holes in. This still means that the forward end of the Steam Engine base plate will rest centrally on the rear row of holes of the Flat Plate.

The chain drive for the mast slewing and the first stage of gearing is quite evident from the original




**The 'mystery' side of the Steam Derrick revealed! This shows the logical disposition and construction of the gear-shift levers.**

illustration in the 1930 Steam Engine Manual and is as follows: The Counter shaft of the engine is replaced with a 4½" Rod which protrudes ½" through the near side of the engine plating. It is, of course, fitted internally with the special fine-tooth reduction gear of the old Steam Engine and then a Collar for internal lateral alignment towards the far side plate. On the outside, a ¾" Sprocket Wheel is fixed to the shaft and then, about 1" further out, a 1" Gear Wheel is attached. The shaft above this one is 5" long and carries a Worm and spacing Collar between the engine plates, as shown in Fig. 4, while outside it carries the slotted or female portion of a Dog Clutch. Taking care to get free running alignment, a Socket Coupling (vital to the original model, but completely unmentioned in the 1930 parts list) is fitted with a 1" Gear Wheel, from which the Grub Screw has been removed, and the second half of the Dog Clutch, similarly treated. Each end of the Socket Coupling has a pair of Grub Screws and these should be carefully tightened on the Gear and Dog Clutch portion to ensure axial alignment throughout. The sub-assembly resulting must spin freely with no binding on the shaft. An external Collar fixed to the last-mentioned shaft holds the Socket Coupling assembly on the shaft with clearance from the other section of the Dog Clutch.

Bearings for a 3" vertical Rod carrying the slew drive are formed by a 2½" x ½" Double Angle Strip bolted across the top of the Steam Engine plating, as shown, and the junction of the base plate and the 5½" x 3½" Flat Plate. Where these latter two meet, the matching central hole should be drifted clean to ensure a free-running bearing for the lower end of the slewing shaft. Washers should be fitted at all stages on shaft components subject to rubbing friction. The 3" slewing shaft is passed down through the Double Angle Strip and through a 57t Gear Wheel fixed on the shaft to mesh with the Worm. The other ¾" Sprocket Wheel is mounted on the shaft, boss downwards, and the shaft is passed through the plating below. The top and bottom end of the shaft are held by Collars, fitting Washers in the process.

At this stage the 24½" tie legs of the derrick may be bolted one hole in from the rear of the base, leaving them loosely bolted, slotted flanges outwards and angled to the top/rear. They are laid flat while the mast is stepped. The 1" Rod held by the 3" Sprocket Wheel is placed into the centre of the 2½" Strip at the front of the base where it is secured with a Collar from below. The tie legs are raised up and their ends lapped over, then they are joined centrally to the upper 1½" Angle Girder by a 3/8" Bolt and lock-nuts. The mast should be checked to see that it is free to turn without binding and that it is standing upright. If it is not, the tie legs or lower bearing Strip should be checked for correct placings. About 20" of Sprocket chain are now run between the slewing shaft lower Sprocket Wheel and the 3" Sprocket at the foot of the mast. A preliminary steaming may be made at this stage to check the Dog Clutch gear and slew drive.

## AUXILIARY GEAR BOX AND CONTROL LEVERS

We now come to a second weakness in design, i.e. the braking system which is built on to the far side plate of the gearbox. Two ½" Bolts are fitted into either end of a 2½" Strip where they are tightly secured with Nuts. A Washer is slipped on each Bolt and then a 3½" Strip over each Bolt shank, one hole in from its end. Three more Washers are placed on the Bolts and then another Nut done up just a little more than finger tight. The Bolts are passed through the top row end holes of a 2½" x 2½" Flat Plate and are secured tightly with a Nut on each shank. The last two Nuts on each Bolt shank are adjusted to ensure that the two 3½" Strips offer considerable resistance to being moved. This is to ensure that they will stay in the "On" or "Off" position – not a very sound mechanical design! The bottom hole of each brake lever thus formed is fitted with about 6" of Meccano Cord tied at one end only while the other end is passed back through the same hole to form a loop a little over 1" in diameter and loose knotted for subsequent adjustment.

Fitted by its slotted holes at the bottom of the same side of the Plate as the brake gear is a 2½" Angle Girder which is also bolted four holes in from the edge of the 5½" x 3½" Flat Plate, as shown in Fig. 5. The near-side gearbox plate is produced in the same way, but without brake gear.

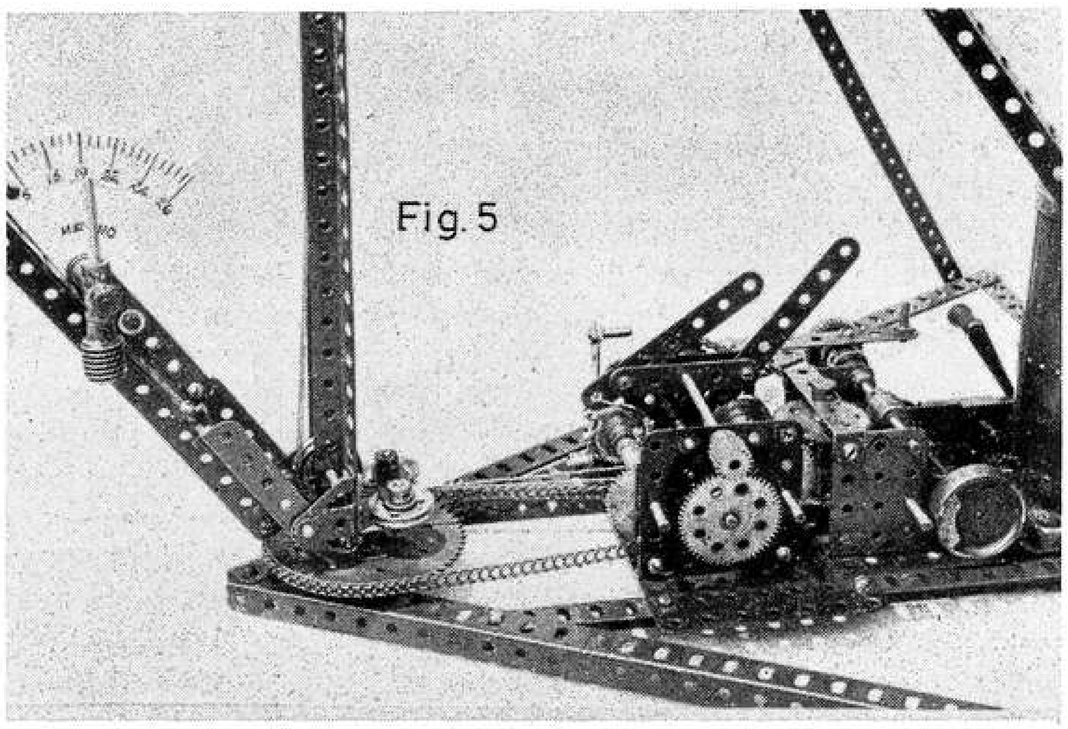
Winding barrels for the hoist and luffing gear are made from 3½" Rods, each fitted with a 1" fixed Pulley and a 50t Gear Wheel. Both shafts revolve at identical speeds so either can be used for luffing or hoisting – perhaps the rear shaft being preferred for hoisting to reduce the forward angle to the guide Pulleys at the foot of the mast – the 1" Pulleys are fitted boss inwards and spaced with Washers from the gearbox plates to lie directly underneath the brake levers. The 50t Gear Wheels are staggered, however, to permit gear engagement. The front winding shaft 50t Gear Wheel is fitted boss inwards, while the rear shaft Gear is fitted boss outwards. A spacing Collar is included to set in the toothed edge of the Gear about ¾" from the side plates. Both shafts can be seen in the close-ups and they lie in the front and

rear holes of the 2½" Flat Plates exactly half-way up.

A fixed counter shaft made from another 3½" Rod receives the drive from the Steam Engine via the ¾" Sprocket on the Steam Engine shaft, and 1" Sprocket on the far side of the gearbox. About 10" of Chain is required for this connection. On the near end of this counter shaft, which is mounted top centre of the 2½" side plates, a ½" Pinion with a ¾" face is fixed. To complete the gearing, a 4½" Rod is mounted between the two winding shafts and is fitted with a 25t Pinion which engages the 50t Gear Wheels on the winding shafts according to the setting of a gear-shift lever. This shaft is free to slide in the gearbox side plates over a limited range.

The gear-shift levers are fitted to complete the mechanisms in the gear-box area. That which engages the Dog Clutch for slewing is a 3½" Strip fitted with a short Threaded Pin at its rear end and a standard Bolt locked in place with a Nut, three holes along from the Threaded Pin. Its shank, pointing downwards, engages in the slot of the Socket Coupling, but must do so without binding or offering excess pressure. The inner end of this 3½" Strip is lock-nutted on a ½" Bolt to a 1" x ½" Angle Bracket, mounted on the top rear corner hole of the far side plate. Its long lug passes through the Sprocket Chain loop and its slotted hole receives the Bolt and lock nuts on which the shift lever pivots. Packing Washers are used to keep the engagement Bolt shank at the right height for clean engagement in the Socket Coupling slot. The lock-nutted Bolt should be tight enough to prevent the shift lever from wandering when set in the slew position.

No evidence of the gear-shift lever for the winding barrels is shown in the original Steam Engine Manual picture of SML 6a, but at this stage, the only surplus parts left over after catering for the rigging blocks are a 1½" Double Angle Strip, two Cranks, a 2½" Strip, a 2½" Rod, a Threaded Pin and some Nuts and Bolts. However, turning over to page 16 of the Steam Engine Manual, we see the identical set of components used on the Steam Digger for a gear-shift lever mechanism. This can be seen clearly in the illustrations in Fig. 4. The 4½" Rod used as the gear-shift carries three Collars at its right-hand end. Two of these are fixed and sandwich the third Collar which is not locked to the shaft. Instead, it carries a standard Bolt, partly inserted into one of its tapped holes and




**Close-up of nearside of gearbox. The pointer for the jib indicator is a 1½" Rod in a Coupling joined to a Worm. The pointer pivots on a 1½" Rod held by a Crank bolted to the jib.**

secured by a lock-nut. The Bolt shank is held by its head in the slot of one Crank, but is free to ride in the slot. The 1½" Double Angle Strip is bolted to the large Flat Plate as shown in Fig. 4 and acts as a journal for the 2½" Rod. The forward end of this carries the second Crank extended by the last 2½" Strip and topped by the remaining Threaded Pin. Finally, the Cord loops on the brake levers are passed round the grooves of the 1" Pulleys on the winding shafts and are tied in place with just a little slackness in the Pulley grooves. (A pair of tweezers is very helpful here!)

## RUNNING GEAR

For the running gear two 1" Pulleys are mounted on the Threaded Pins at the rear of the crane mast followed by a 1½" Strip and two Collars as shown in Fig. 4. The mast head is rigged with two more loose Pulleys on a 1" Rod five holes down and held in place by Collars, as shown in Fig. 2. The three-sheave luffing block at the head is made from two 3½" and two 2½" Strips spaced by four Washers in each gap. These are placed on 1½" Rods held in place by Collars as shown and the complete block pivots on a 1" Rod, one hole below the mast top.

Four 2½" Strips form the jib head block frame and this is clear from Fig. 3. A fixed 1" Pulley is held on a 2" Rod in the lower row of holes in the Flat Girders, five holes from the top, and this shaft must be free to revolve, being held in place, without pinching, by Collars and Washers. The upper hoist block is clear from Fig. 3, two 2½" and a central 3" Strip separating the two loose 1" Pulleys held on a 1" Rod. All blocks mentioned use four-washer spacing. Two 2½" Triangular Plates form the main hoist block, being spaced at three corners by ¾" Bolts and Nuts. A pair of 2½" Strips form separators across the top of the block and these are allowed to 'float' as the ¾" Bolts do not allow satisfactory Washer spacing.

Meccano Cord is attached to both winding barrels by a simple overhand knot round the Rod and then securely tied to the Bolts or Set Screws in the 1" fixed Pulleys. Both hauling ropes pass through the first pair of horizontal guide pulleys together. The model here is illustrated fully rigged, but, again, even with the Steam Engine running at full speed, luffing and hoisting motions are slow and nothing like scale speed. To get some life into the model it is necessary to run the rigging back to single pulley working on all blocks. Fortunately the old Meccano Steam Engine still has plenty of power to cope.

### Parts List for Super Model SML 6a

The following parts list is a correction of that originally published in the 1930 Steam Engine Manual. Where the original number of parts required was in error, the error figure is shown in brackets.

**PARTS REQUIRED**

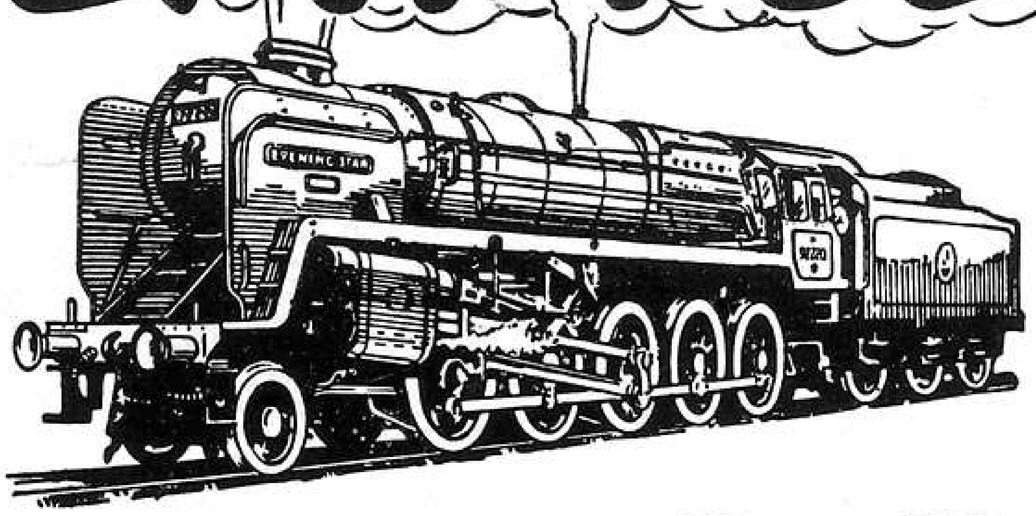
| | | | | | |
|---|---|---|---|---|---|
| (3) | 5- 3 | (9) | 8-18a | | 43-59 |
| (3) | 2- 4 | (4) | 5-18b | | 3-62 |
| | 15- 5 | | 3-22 | | 1-63 |
| | 4- 6 | | 17-22a | **(1) | 0-63d |
| | 1- 6a | | 1-25 | | 2-72 |
| | 4- 7 | (1) | 0-25a | | 2-76 |
| | 5- 7a | (0) | 1-26a | (26")30" | -94 |
| | 4- 8 | | 2-27 | | 1-95b |
| | 2- 8a | | 2-27a | | 1-96 |
| | 8- 9d | | 2-31 | | 2-96a |
| | 2- 9f | | 2-32 | | 4-103 |
| | 2-12a | | 82-37 | | 3-111 |
| | 1-12b | (12) | 20-37a | (1) | 2-111a |
| | 1-15 | | 66-38 | (0) | 3-111c |
| | 2-15a | | 2-40 | | 4-115 |
| | 3-16 | | 1-48 | | 2-126 |
| (3) | 1-16a | | 1-48a | | 1-144 |
| (0) | 1-16b | | 1-52a | (0) | 1-171 |
| (3) | 4-17 | | * 1-57b | | |

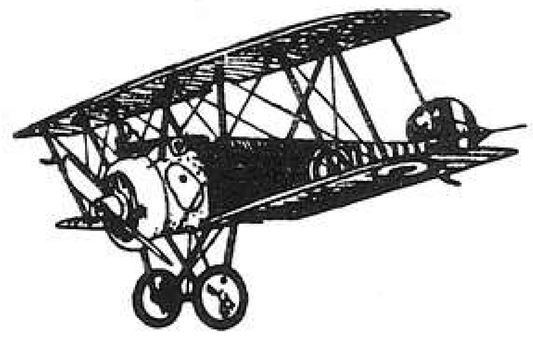
1 Meccano Steam Engine 1930

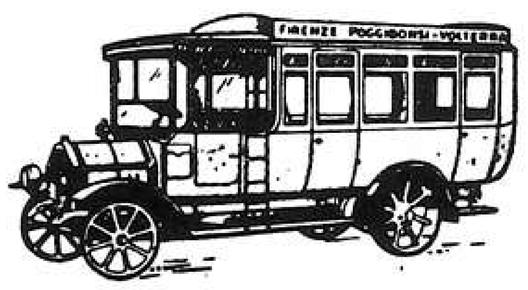
* *This is the only obsolete part (Large Loaded hook)*

** *63d did not exist in 1930.*

# BEATTIES







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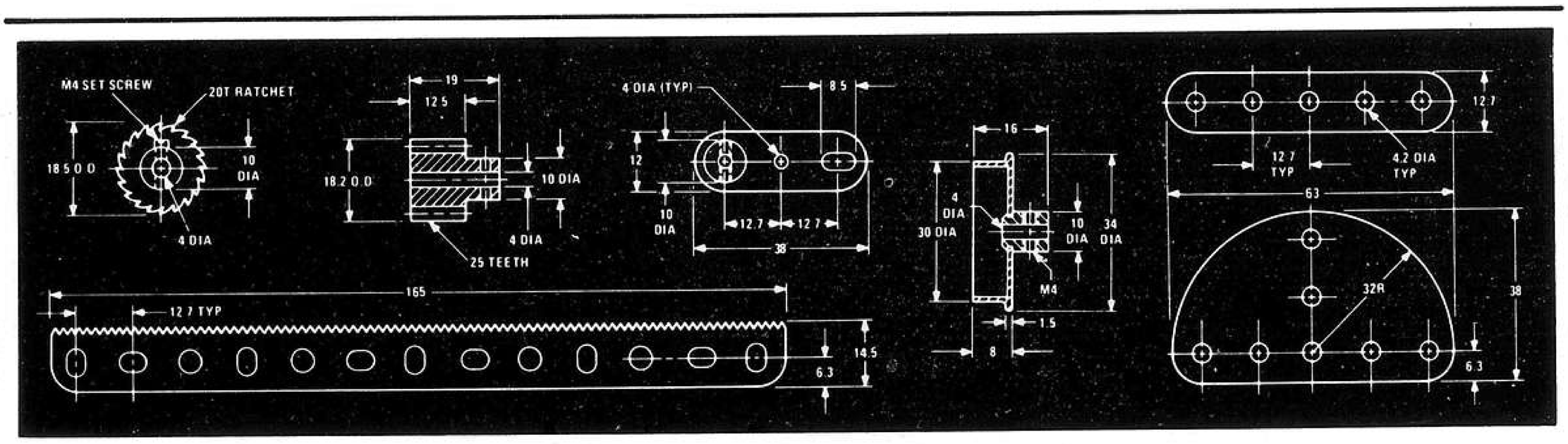


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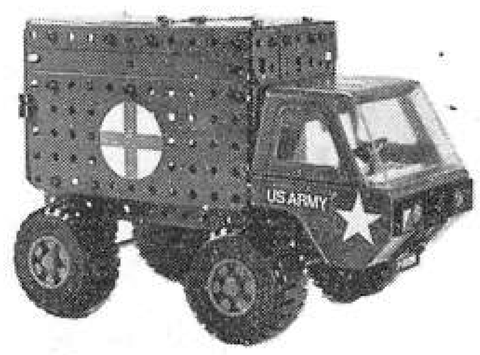


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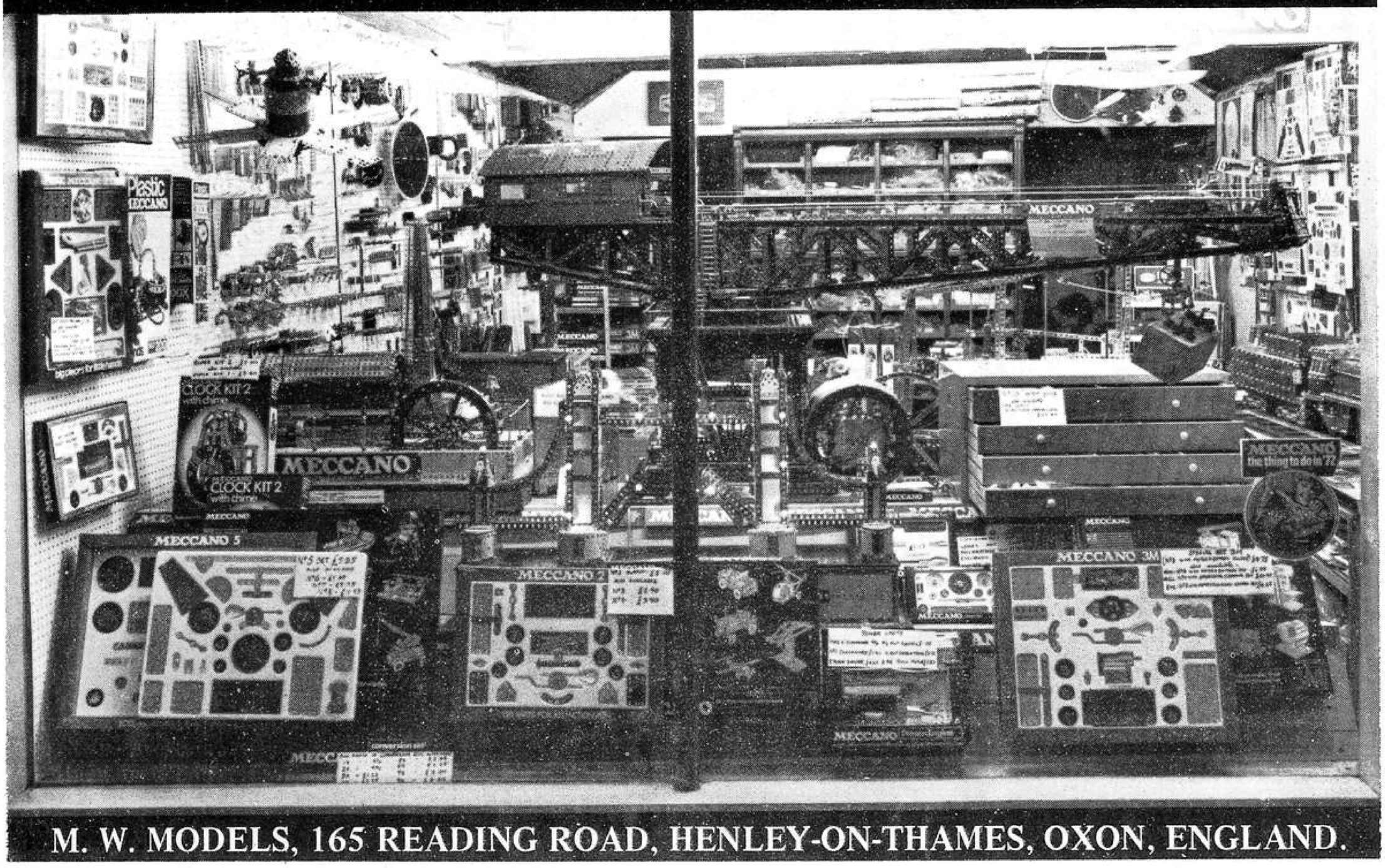


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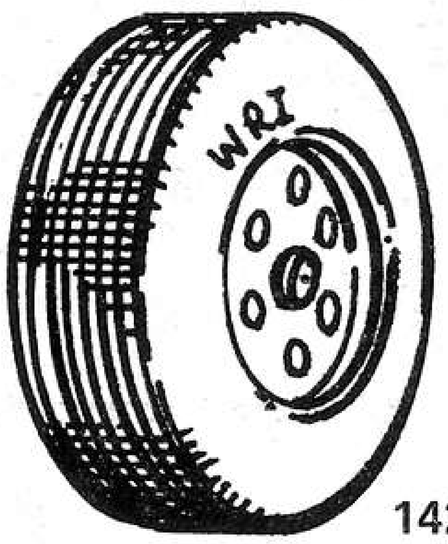


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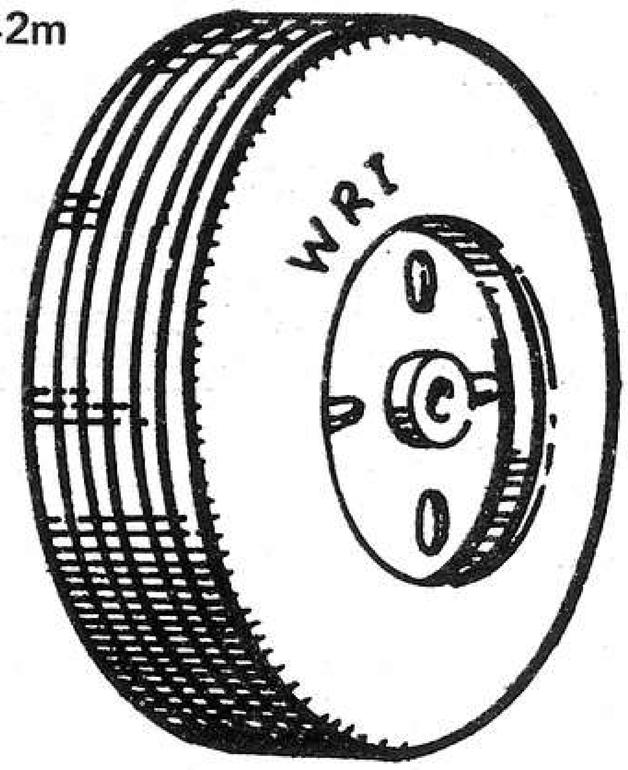


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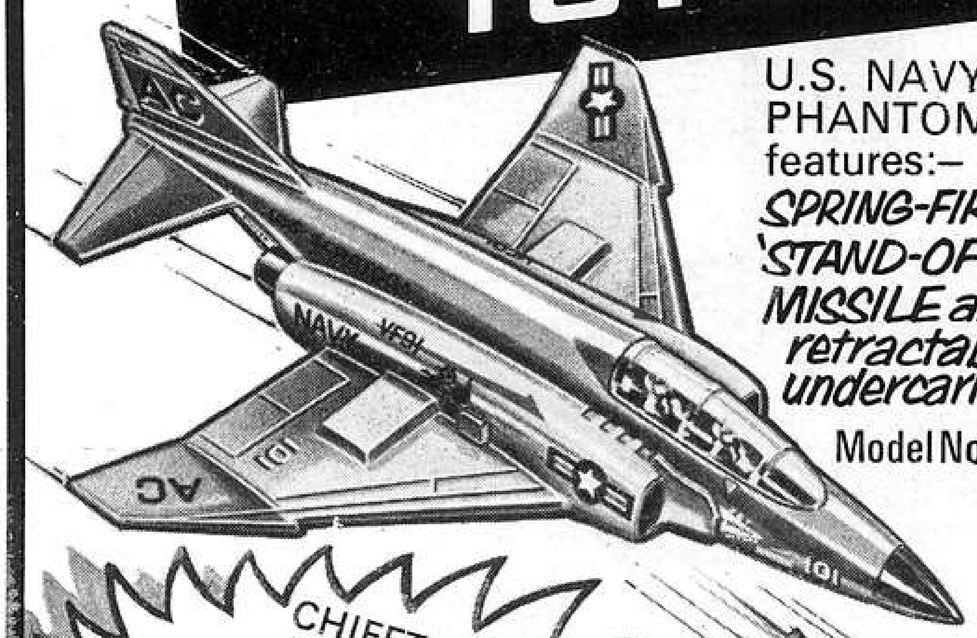

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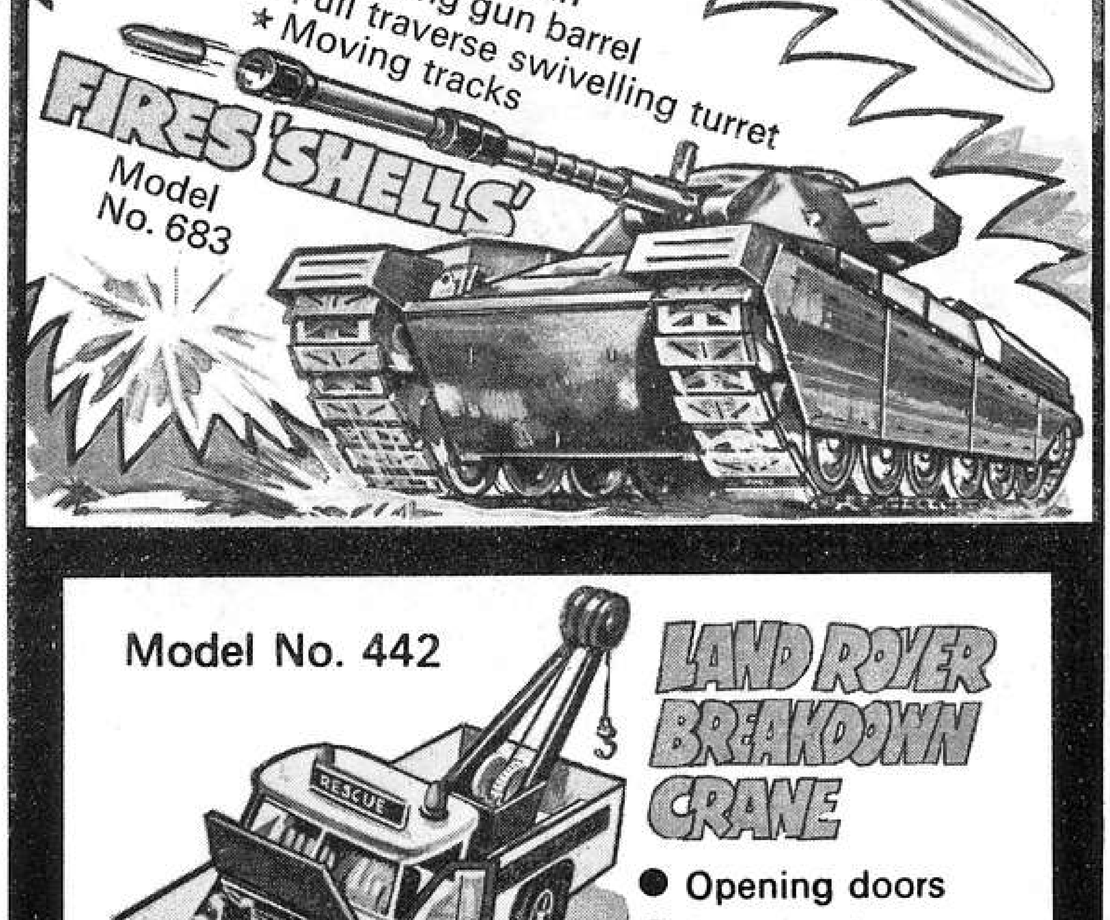

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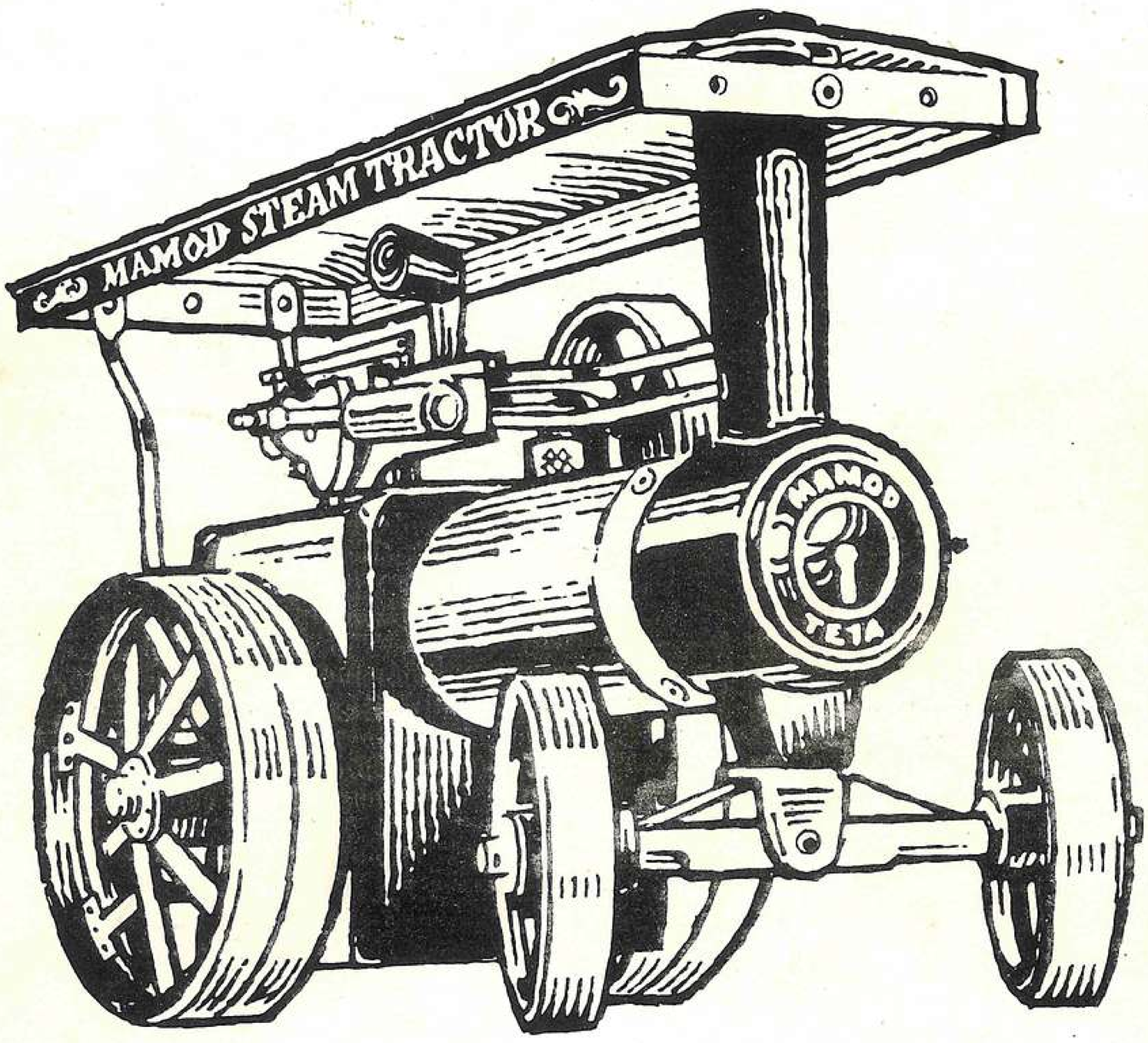


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Supplement to the October 1973 issue

# GRANDFATHER CLOCK

by B.N. Love

## A Meccano No.10 Set Model

**This building description is intended for use in conjunction with the photographs of the Grandfather Clock appearing in the October 1973 issue of Meccano Magazine Quarterly.**

IT IS nearly twenty years since a Supermodel Leaflet was published for a No. 10 Set Model and over forty years since the original "New" Meccano Grandfather Clock appeared on the scene, so it is with very great pleasure that I present this fine model. Its origin lies in the self-imposed challenge of building a reliable long-case clock of attractive appearance using nothing but the contents of a No. 10 Set, yet exploiting as many parts in the outfit as could reasonably be employed in the model. No additional Nuts and Bolts were to be used and, to all intents and purposes, the clock was to be of a "Robinson Crusoe" nature where the builder had no other tools, equipment or spares other than a new No. 10 Set.

One of the greatest difficulties in the original design was to allocate the limited number of parts to the various clock sections which are as follows: (1) base unit, (2) trunk or main clock-case, (3) ornamental clock top, (4) various dials and hands, (5) epicyclic maintaining winding drum, (6) main clock motion, (7) escape and pendulum and (8) chain-driven and half-hour strike. An immediate choice for the eight 24½" Angle Girders was that of forming the four compound uprights of the corners of the clock-case giving a little over four feet in height to this section. Next in line were the eight 18½" Angle Girders, four of which were allocated for the base unit and four for the removable front panel of the clock-case, essential for pendulum bob and other adjustments. These were the easy choices, but, with a very limited number of 9½" and 7½" Angle Girders – only six of each – allocations became quite a poser. Taking the plunge, all six 9½" Girders were designated for the base unit, a general description of which now follows:

### BASE UNIT

Fig. 1 shows the general form of the base which has a framework of Angle Girders, 18½" wide, 9½" deep and 12½" from front to back, four of each size Girder being required. Additional bracing is supplied on the top of the base unit by two more 12½" Girders set-in six holes from each side to support and form the base anchorage for the main clock-case above, while a further two 12½" Girders run across from front to back inside the base unit at the bottom, immediately below the upper pair just mentioned. Four 9½" Flat Girders are also in the No. 10 Set and these are used at the front and rear of the base unit to give vertical support and to act as anchoring points for the Flexible Plate covers.

With some twenty 12½" Strip Plates and thirty 5½" x 2½" Flexible Plates in the Set, temptation was to fill in the base unit all round, but the game of robbing Peter to pay Paul featured extensively throughout the design and construction of the clock and strict economy became the most limiting factor. However, only six 12½" Strip Plates and four 5½" Flexible Plates could be spared for covering, but, by pressing two Flanged Plates, three 6" Circular Plates and four 5½" Blue Plastic Plates into service, most of the front and sides of the base were reasonably clad and, by using the two 12½" Braced Girders and a few Flexible Triangular Plates, the remaining 'holes' were largely plugged.

At the rear of the base unit, Sector Plates and a large Flanged Ring support the framework, even the 6" Pulley adding its weight in the centre of the Flanged Ring. The two remaining 9½" Girders give additional vertical bracing inside the base, being bolted to the flanges of the inside 12½" Girders and running up to the top pair of similar Girders at the trunk base where they are secured to the slotted flanges of these Girders by the sturdy 3½" x 1½" Double Angle Strips employed as rather large Angle Brackets. Four 2½" Angle Girders, each carrying one Double Bent Strip, are bolted under the base at each corner, five holes in, to form bearings for 3½" Rods which carry the clock feet.

One might ask, "How are 3" Pulleys and Motor Tyres used in a Grandfather Clock?". And the answer is "By letting them serve as wide support feet!". This is exactly what is done here, four of the six Tyres and Pulleys serving at the front and one more at the two rear corners. To balance height and to give good clearance of the base unit above carpet level, each of the Rods mentioned is padded out below the 2½" support Angle Girders by 1½" Pulleys with Tyres; while extra 2½" Pulleys are added to the rear feet to make up the necessary height for level-standing of the base unit.

### CLOCK-CASE

The trunk section of the clock-case is made from 24½" Angle Girders, Strips of various lengths and a variety of Flexible and Flat Plates. Compound Girders for the front edges are made by joining pairs of 24½" Angle Girders by means of a pair of 3½" Flanged Plates set at right angles, their flanges just lapping each other top and bottom. A gap of one hole is left between the Girder ends which is then overlaid with a 2½" Strip. Rear corners of the clock-case are again 24½" compound girders, but this time they are supported at their join by a 5½" x 2½" Flanged Plate which offers rigidity to an otherwise weak joint. Fig. 3 shows the clock-case opened up so that the plating can be seen.

Fourteen 12½" Strip Plates remain in the outfit and these are used at the upper and lower ends of all four compound girders, but two of them are reserved to act as horizontal panels to the top and bottom front of the clock-case. This gives a 12½" width to the case, the front-to-back dimension being 9½". All Girders of this length having been used up in the base unit, the four 9½" Strip Plates are used horizontally on each side of

the clock-case for top and bottom panels and two of the six 9½" Strips are used halfway up the sides as fore and aft spacers.

Of the 12½" Strips available in the No. 10 Set, two are used for the base unit – one on each side to hold the side plating – two are used for vertical overlays on the front panel and two are used as spacers/overlays on the 12½" Strip Plates forming the top and bottom of the front of the main clock-case. This leaves eighteen 12½" Strips which are soon swallowed up as vertical overlays to the Flexible Plates covering the front and rear corners of the clock-case.

Horizontal spacing of the case sides is maintained by compound strips formed from a pair of 2½" Strips joined by a 5½" Strip. These are fixed at regular intervals up the case side. Blue Plastic Plates are interlaced over the front vertical Flexible Plates to augment covering facilities and to produce a pleasing contrast in a symmetrical design. Liberal horizontal overlay by 2½" Strips features extensively, but, all the time, consideration is given to making one Bolt and Nut secure as many items as possible as economy here is vital. Transparent Plastic Plates form central 'windows' in the detachable front.

## FRONT PANEL

This is made from pairs of 18½" Angle Girders at each side which are joined by 2" Angle Girders with no gap and then overlaid at the middle of the join with 1" Triangular Plates. These in turn hold ½" Angle Brackets to support the central 5½" Circular Girder to give correct spacing of the middle of the panel. One 7½" Angle Girder is used to space and brace the panel at its bottom edge and its outer fixing Bolts trap Reversed Angle Brackets inside which clip over the open edge of the clock-case front to keep the bottom edge of the panel in place. At the top, the panel is braced by two 7½" Strips, five holes apart, the upper Strip carrying a 5½" x 1½" Flexible Plate and two Semi-circular Plates. Two more Semi-circular Plates are mounted above and the general curved form obtained is edged with Formed Slotted Strips bolted to the side Angle Girders and attached to the top 5½" Strip by Double Brackets.

Flexible Plates, 5½" x 2½" and 2½" x 2½", are used for the front plating at the top end of the panel. These are overlaid by compound strips made from 5½", 3½" and 2½" Strips. Panel bracing above and below the central Circular Girder is by two 7½" Flat Girders overlaid with 3" Strips and fitted with 2½" Stepped Curved Strips with 1" x ½" Angle Brackets to hold the top and bottom holes of the Circular Girder. Similar construction is used in the lower section of the panel, but Flexible Plates 1½" wide are used and are overlaid by a pair of 12½" Strips. Five holes below the top centre, a 1½" Rod is fitted with a Handrail Coupling and passed through the centre of the upper 7½" Strip where it is fitted with a Compression Spring and then a Pawl with Boss, boss inwards, to act as a turn-catch for securing the panel to the upper edge of the case opening. Triangular Flexible Plates add ornamentation to the two Circular Girders, as shown, and the bottom of the panel has a 5½" Braced Girder backed by a 5½" x 1½" Blue Plastic Plate. Transparent Plastic Plates are fitted down the centre of the top section of the panel and two more across the lower portion above and below the second Circular Girder. This lower Circular Girder frames the pendulum bob nicely and gives a pleasing visual effect as the pendulum swings.

## ORNAMENTAL TOP AND DIALS

Built as a single unit, the clock top is made from Girders and Plates and can be clearly seen in Fig. 4. Economy in the use of Angle Girders makes it necessary to do a fair amount of joining-up in this area as eight 12½" Girders have been used on the base unit, two on the main clock-case and two more are required for supporting the clock motion and weights. This leaves only four available for the clock dial framework. However, a compound 12½" girder is made from the remaining two 12½" Flat Girders (two having been used at the sides of the base) and four 5½" Girders to make up two units immediately to the left and right of the clock dial. Two standard 12½" Girders are joined with the compound pair above and below the dial to form the edges of a square which is filled in with Flexible Plates. Each side of the square supports a 4½" x 2½" Flat Plate behind the Flexible Plates and mounted centrally on the 12½" Girder units, giving rigidity and anchoring points for the 6" Circular Plate forming the main dial centre. The second large Flanged Ring forms the numeral background while the numerals themselves, which are 1½" Strips, are bolted to Double Brackets at their inside ends, the Double Brackets being sandwiched between the pair of 7½" Circular Strips bolted to the four Flat Plates mentioned. By this arrangement it is possible to slide the numerals into the correct 12 divisions of the dial. Positions at 12, 3, 6 and 9 o'clock are bolted directly to the Flat Plates by long Bolts passing through the Flanged Rings and held in place by lock-nuts. This type of construction gives a recessed design to the clock dial centre allowing the hands to be positioned nicely against the numeral positions.

Wing panels are provided for the ornamental top by using the last two 12½" Angle Girders on the outside edges and two more 12½" units, compounded from one 3½" and two 4½" Angle Girders, on the inside. These are spaced by the last four 2½" Angle Girders, overlaid with 2½" Stepped Curved Strips top and bottom, panel filling being provided by a pair of 5½" x 2½" Flexible Plates with the two 2½" x 1½" Flanged Plates contained in the No. 10 Set. Each of these Plates carries a 1" loose Pulley with Rubber Ring and ¾" Washer as ornamentation. Further compound girders extend over the top of the dial frame to secure the wing panels at their top ends. A pair of 5½" and one 7½" Angle Girder make up this compound length and they are attached to the dial frame at the top by the remaining two 7½" Flat Girders which lie on top of the 12½" standard Girder and the 18½" compound girder.

Ornamentation at the top of the clock is carried out in what Flexible Plates and Triangular Plates remain. These are overlaid with four 5½" Curved Strips at the very top and are fitted with a roof of 5½" x 1½" Flexible Plates supported at the rear by four more 5½" Curved Strips. Formed Slotted Strips, in threes, give the finishing curvature at the extreme sides of the ornamental top and these are held in place by 1½" Angle Girders attached at each side of the clock to the wing panels by the two available Corner Angle Brackets, one left-hand and one right-hand.

Three finnials complete the decoration above the ornamental top, being made from Sleeve Pieces and small Flanged Wheels at left and right and from a 3" Cylinder, Boiler End, etc., in the centre top. This is held in place by a 6" Screwed Rod passing through two large Flanged Wheels at either end of the 3" Cylinder and is capped with spare Gear Wheels and a Screwed Rod Adaptor at the peak. All of the 2½" x 2½" 'U' Section Curved Plates are used as a scroll edge to the wing panels mentioned. These need deft fingers, or preferably a pair of long-nosed tweezers for putting the Bolts and Nuts in place. (Robinson Crusoe would have to use a twig, split at one end!).

Observant readers will have noticed a ping-pong ball at the top of the clock doing duty as the moon on the moon-motion Axle Rod. This obviously floated ashore as a natural buoyant piece of flotsam! Purists may use one of the six or eight-holed Wheel Discs, used elsewhere on the clock as pure ornamentation, in place of the ping-pong ball. If used thus, the Wheel Disc should be attached to the moon shaft by a Bolt through its centre into a Collar-robbed, of course, from some other part of the clock where a Spring Clip is substituted?

Hour and minute hands are made from Axle Rods. A 6" Rod, fitted with a Rod and Strip Connector, forms the minute hand and is carried by a Handrail Coupling on a 5" Rod running through the loose 57-teeth Gear Wheel and into the main clock movement. A 3" Rod forms one part of the hour hand and is carried in a Handrail Support, fixed in one hole of the Gear Wheel. A second Handrail Support holds a 1" stub axle in the opposite hole to form the tail of the hour hand and this permits the Handrail Coupling holding the minute hand to recess neatly through this gap in the hour hand. The seconds hand shaft protrudes through a 6-hole Wheel Disc which traps a Wheel Flange in place by two Pivot Bolts secured by Cord Anchoring Springs at the rear of the dials. A Collar on the end of the shaft holds a 1" Screwed Rod and a counter-balancing ¾" Bolt. Construction of the small 24-hour dial below is similar.

## EPICYCLIC MAINTAINING WINDING DRUM

Figs. 5 and 6 give general views of the motion from the right-hand side of the clock. Front and back plates are identical and are made by bolting two 5½" x 2½" Flat Plates centrally on the top row of holes in two 5½" x 3½" Flat Plates. These latter Plates are carried lengthways by two 12½" Angle Girders spaced by a pair of 4½" Double Angle Brackets at each end of the Plates at the bottom, the same Bolts also holding four 5½" Curved Strips, forming arch supports, to the Angle Girders. Four 5½" Angle Girders are bolted to the ends of the 12½" Angle Girders and then to the clock case side by their slotted holes. The four 5½" Curved Strips are then bolted to the bottom ends of the 5½" Angle Girders. Fig. 5 shows a pair of 2½" Triangular Plates mounted on the pair of 12½" Girders. These carry a 5" Rod in Cranks to make a Pulley bar for extending the weight run if required.

A maintaining winding drum is the heart of the clock and is made from two 3" Sprocket Wheels joined by three 2½" Double Angle Strips and one 2½" Rod, these four last-mentioned items being located at 90° in the outside ring of holes in the Sprocket Wheels. Four curved 2½" x 2½" Flexible Plates are bolted to the Double Angle Strips to form overlapping sections of a smooth winding drum, the final joint being made by passing Bolts through the last lapped pair of Plates and into a pair of Collars underneath the Plates, held on the 2½" Axle Rod. One of these Bolts is 3/8" long and is locked in place with a Nut to leave a short projection to which the twisted-up Meccano Cord is attached for the weight drive.

Choosing the straightest 6" Rod in the outfit, this is fitted with a 1" Sprocket Wheel at one end and passed through the clock plates three holes up and in the centre of the 5½" x 3½" Flat Plates, the winding drum being slipped on in the process for a trial spin. This must be as free running as possible – any binding at any stage of the clock motion will prevent the clock working. The Nuts and Bolts should be adjusted round the drum as necessary for smooth rotation. Now the winding drum is fitted with two 3" Rods, 180° apart, through two of the remaining outside ring of holes in the Sprocket Wheels. Each Rod carries a 19t Pinion at one end and a 57t Gear Wheel at the other. A loose 57t Gear Wheel is then bolted centrally to a 3½" Gear Wheel by two Pivot Bolts and this is tested separately for free spin without binding. The whole drum may now be assembled for a trial wind.

The 6" Rod should be checked again for straightness and the 1" Sprocket Wheel fixed to the front end, boss to rear. The Rod is then inserted through the clock plate from the front and fitted with a 19t Pinion (boss to front) with double Grub Screws, followed by a ½" Plastic Pulley as a spacing washer. The Drum, with the two 57t Gears facing to the front (their own bosses to rear) is worked onto the Rod, pushing the Rod right through the drum. The 3½" Gear, which will be the main driving Wheel for the clock, must have its 57t Gear attached to it by the Pivot Bolts mentioned, but a Collar is placed on each Pivot Bolt to space the two Gear Wheels apart. The boss of the 57t Gear faces front and that of the 3½" Gear to the rear. This latter component is placed on to the 6" Rod last thing before thrusting the Rod through the back plate of the clock where it is fitted with a Ratchet Wheel. No set screws are used on the bolted pair of Gears just mentioned and they must be free on the winding shaft. The drum should now revolve freely round its shaft, all fixed Gears meshing and running in planetary motion.

The winding train is completed by locating a 2½" Rod eighteen holes below the 6" Rod, in the front of the clock-case (see Fig. 4), carried in a 3½" Strip at the front, bolted to two vertical 3½" Flat Girders as shown and supported behind the panel by two Girder Brackets carrying two 3½" Double Angle Strips reinforced by a 3½" Flat Girder. This gives a sturdy rear bearing for the key shaft which is fitted at the rear with a second 1" Sprocket Wheel and at the front with a Collar secured by a short Grub Screw and a Set Screw. This engages with the slot of a Socket Coupling bolted to a Bush Wheel and a pair of 3½" Strips which form the winding key. This can be seen in Fig. 5. where it is stowed in a Slide Piece at the back of the clock for easy access. The key has a handle made from a Worm Gear covered by a Chimney Adaptor, both mounted on a long Bolt and lock-nutted to the two 3½" Perforated Strips. A dummy cover for the key shaft is made from a 6-hole Bush Wheel fixed by long Bolts to a Wheel Flange which give enough friction grip to hold the cover in place without further Nuts, simply by pushing the plate over the end of the key shaft and allowing the long shanks of the Bolts to pass through the horizontal 3½" Strip. Some 38" of Sprocket Chain then completes the winding mechanism. The epicyclic design maintains the clock motion during a full rewind.

## MAIN CLOCK MOTION

Fig. 7 gives a clear view of the escape train from the "Great Wheel" (3½" Gear Wheel) upwards. One 2½" x 2½" Flat Plate is fixed by long Bolts with Coupling and Collar spacing to the front clock plate at the level shown in Figs. 5 to 8 and a second plate is attached by 2" Screwed Rods to the back plate with paired ¾" Flanged Wheels as spacers – see the same Figs. A 4½" Rod is mounted immediately above the Great Wheel and carries a ½" face, 19t Pinion at the inside rear and a normal 19t Pinion further along the Rod which passes through the middle bottom hole of the front 2½" Plate. The rear 19t Pinion meshes with the Great Wheel, while the other meshes with a loose 57t Gear Wheel on the minute hand shaft.

Continuing up the rear of the

clock, a 2" Rod carries a ¾" face, 19t Pinion (to give a necessary reversal of motion for the seconds hand) and a 2½" Gear Wheel at the rear of the clock. Another 2" shaft directly above carries a 19t Pinion outside and a 60t Gear Wheel inside the clock as is shown in Fig. 7. Selecting the best remaining 6" Rod, this becomes the seconds hand shaft and is pushed through from the front of the clock dial. The larger half of a Dog Clutch is fitted with a 1" Screwed Rod and a counter-weighting ½" Bolt in its opposite screwed holes to form the seconds hand which is firmly attached to the extreme end of the 6" Rod. This then passes through the front clock plate and into a rear bearing made from two Flat Trunnions and a 1½" Flat Girder mounted on two ¾" Bolts spaced by ¾" Contrate Gears – See Figs. 6 & 7. A Collar and a ½" Plastic Pulley, serving as a thrust washer, and a second Collar behind the front clock plate hold the 6" Rod in lateral position and a 15t Pinion completes the seconds hand shaft.

At this stage a moderate weight should be tried just to get the escape train running to make absolutely sure that there is no binding anywhere. The upper 6" Rod is critical and the rear Trunnion bearing must be adjusted carefully to make sure that there is absolutely no drag on this shaft. It pays to spend time on this.

The escape anchor is made from two 1½" Corner Brackets sandwiching ½" Angle Brackets to form pallets, while the short slot in the paired Corner Brackets matches with the slot in a Double Arm Crank for vertical adjustment of the escapement. A "spider" from a Universal Coupling forms a finger nut for on-the-spot adjustment at the top of the anchor. A Rod carries the escape anchor and is journalled through the rear clock plate and into a Reversed Angle Bracket on the front clock plate – see Fig. 5. An inside Collar and an outside Coupling keeps the escape shaft in place while the Coupling holds a 5" Crank Handle fitted with a Rod and Strip Connector and ½" Angle Bracket to form the pendulum crutch.

The going train of the clock also starts from the Great Wheel with the 19t Pinion and loose 57t Gear Wheel already mentioned. Starting with a Handrail Coupling holding the minute hand on the extreme end of a 5" Rod, this Rod carries first a Washer and then the loose 57t Gear Wheel shown at the front of the clock dial. Another Washer follows and then the Rod goes through a 2½" Strip attached to the main dial with one Nut and Bolt only and then straight through the front clock plate where it receives a 1" Gear Wheel, boss forward, before going through the 2½" Flat Plate. Immediately behind this Plate, the minute hand shaft is fitted with a 1" Pulley with Tyre, boss forward and fixed tightly to the shaft with double Grub Screws. The loose 57t Gear Wheel is pressed against the Tyre by a Compression Spring held in place by the second half of the earlier mentioned Dog Clutch serving as a Collar almost at the inside end of the minute hand shaft. This arrangement allows the hands to be set without undoing Grub Screws, etc.

Drive to the hour hand comes from the 1" Gear Wheel on the minute shaft to a second 1" Gear Wheel to its right, boss forward, on a 3" Rod running to the rear and carrying a Collar and a 25t Pinion. This meshes with a 50t Gear Wheel just above it on a 3½" Rod running between the two 2½" Flat Plates. A second 25t Pinion passes on the drive to a 50t Gear Wheel below it on a 2½" Rod passing through the clock face and fitted outside with a 19t Pinion giving the final drive to the hourhand via the loose 57t Gear Wheel which revolves freely on the minute hand shaft at the front of the clock.

The last-mentioned 2½" Rod also carries a second 19t Pinion just inside the clock to repeat the hour rotation by another 57t Gear Wheel on a 2½" Rod to its right carried in a 3" x 1½" Flat Plate bolted with a Trunnion inside the front lower clock plate. This rotation is then halved by a ¾" Sprocket Wheel driving a 1½" Sprocket Wheel on a 2" Rod acting as the 24-hour movement shaft which is journalled through the front of the clock at the position of the lower dial. Its rear end runs in the front clock plate. The same shaft also carries a Worm for subsequent moon phase drive.

## PENDULUM AND WEIGHT

Essentially, the bob weight is a 4" Ball Thrust Race with the Flange section trapping a ring of loose Steel Balls and sandwiching two 4" dia. Circular Plates and a 5½" Strip between itself and the other portions of the Thrust Race at the rear. A 2" Rod, capped by a Steering Wheel, runs through an 8-hole Wheel Disc, then a Wheel Flange, then through all the other parts mentioned and into a 1½" Pulley Wheel at the back which secures the whole lot together. Two 1½" Rods also pass through the top and bottom holes of the Wheel Disc and through the bob to help keep all parts in register and they are prevented from dropping out by internal Spring Clips.

Fine adjustment is by a pair of Bevel Gears on a 3" Screwed Rod held by two Nuts in an End Bearing at the top of the 5½" Strip, a Threaded Boss providing the final adjustment. An 8" Rod is attached to the bob by a Rod and Strip Connector and is backed by double 2" Strips to form a rigid connection. A really firm joint is made by ½" Bolts spaced by Spring Clips, with a final reinforcement by means of a Collar. Coarse adjustment is provided by allowing the 8" Rod to slide between a pair of 11½" Rods connected to a Bush Wheel at the lower end via Rod Sockets and to a pair of Flat Trunnions screwed to a vertical Coupling by means of Small Fork Pieces and spacing Collars at their upper ends. A set screw in the Bush Wheel gives adjustment while a Double Arm Crank prevents rotation of the pendulum bob.

The Coupling sandwiched by the Trunnions takes the shank of a Screwed Rod Adaptor which carries an 11½" Screwed Rod as the next stage of the pendulum. This is connected by a Threaded Coupling to an 8" Rod and a second 8" Rod completes the pendulum, being joined on by a Coupling. Fig. 5 shows the final attachment via a Flexible Coupling Unit to the bored end of a Slotted Coupling held in a firm bracket at the rear of the clock. This is reinforced by a Coupling, between the 2" Strips shown, which carries an 8" Rod horizontally right through to the front of the clock. The driving weight is two Boiler sections bolted together by four 2" Strips. The upper cap, as the lower, is secured by a 2½" Rod passing through Boilers and Ends. A 1½" Pulley, with ½" loose Pulley spacing runs on a 1" Rod between two 2" Strips bolted to a 1" x ½" Double Bracket on the upper cap. Washers are added as weights until the clock runs comfortably. Three strands of Meccano Cord are twisted up to hold the weight and details are shown clearly in Fig. 3.

A second weight is also shown in Fig. 3, but this is an optional device providing a half-hour strike. Details of this, together with the motion for the moon drive, will be covered in a future issue of the MMQ.

### PARTS REQUIRED

**As this model is built with the entire contents of the Meccano No. 10 Set please refer to the current Contents of Outfits list in the No. 2 Manual.**